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Improvement in Power Mortising Machines.

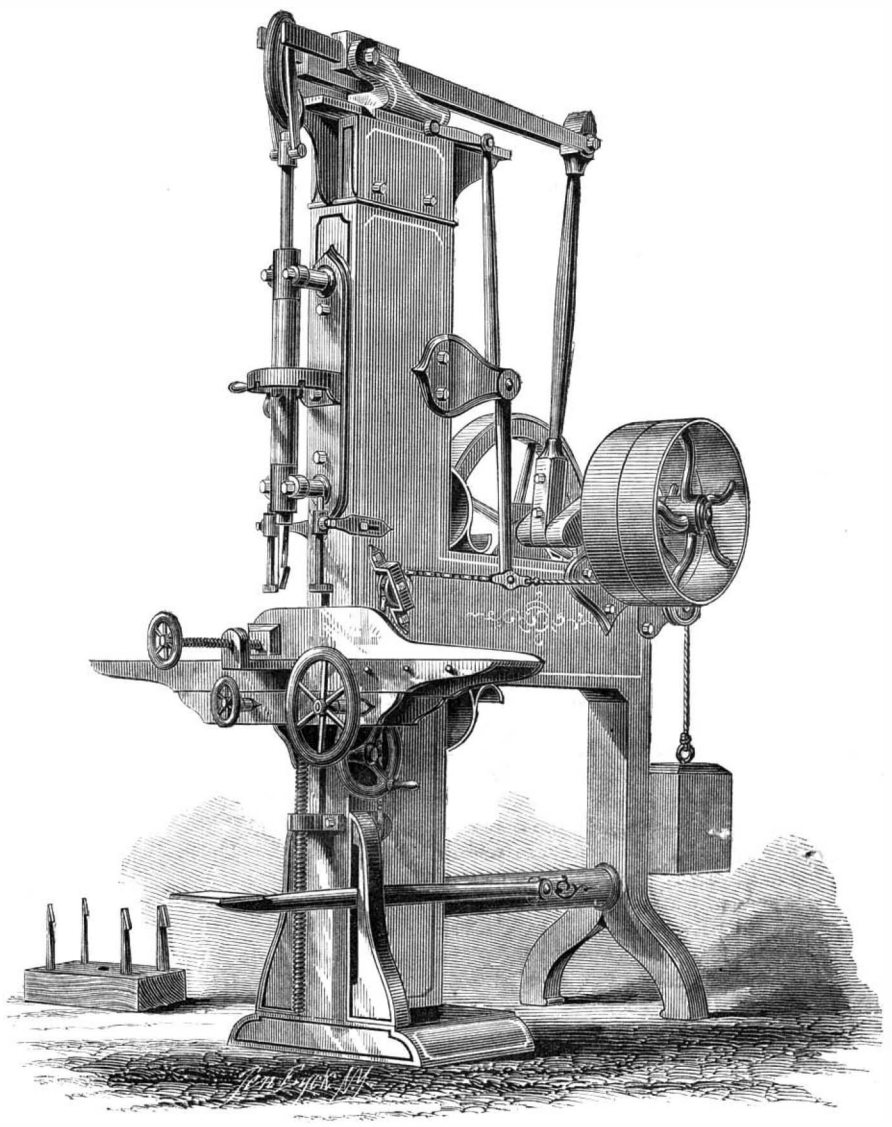
The engraving presents a perspective view of a power mortising machine which seems to possess some very decided advantages in portability, directness of action, compactness, and ease of handling. Beside, it can be placed, like a lathe or planer, on the floor of a shop, and is ready at once to receive a belt, requiring no bracing to keep it in place, as the machine—wholly of iron—has two supports, front and rear, as seen in the engraving.

While the machine is in operation the table, upon which the stuff is to be mortised, remains stationary, so far as its vertical movement is concerned, its only motion being a lateral one, governed by a hand wheel which passes the material gradually under the vibrating chisel.

The movable fulcrum at the top of the machine, sliding on planed ways, is actuated by the foot lever, so that when the foot is raised from the lever, a weight or other device, by a chain connection, brings the fulcrum forward and makes it a dead center of the crank pitman, or a pivot on which the lever plays, so that no motion is imparted to the vertical chisel bar, although the machine may be running and the crank turning. To start the chisel the foot is pressed upon the treadle throwing the sliding fulcrum back until the requisite length of stroke is obtained. Thus the depth of cut in the timber is entirely under the control of the operator. A screw with platen on one end and a hand wheel at the other secures the stuff in place, while another hand wheel will feed it across under the chisel. The upper portion of the carriage can be brought forward or back by another hand wheel, and the whole carriage or platen can be raised by a similar device. All these appliances are directly in front of the operator and under his immediate notice, so that they can be operated by his hand without the slightest change of his position.

The advantages of a movement such as is shown in this machine are, that great power is obtained, and the operator is relieved from the severe jar experiencced when operating machines where the stuff is brought up to the chisel by a rising table. Soon as the mortise is finished the operator raises his foot from the treadle, the sliding fulcrum returns to the front of the machine, and the motion of the chisel instantly ceases, thus avoiding all danger from the chisel while changing the stuff.

Manufactured by Witherby, Rugg, & Richardson, 24 Central street, Worcester, Mass., to whom all orders should be addressed.



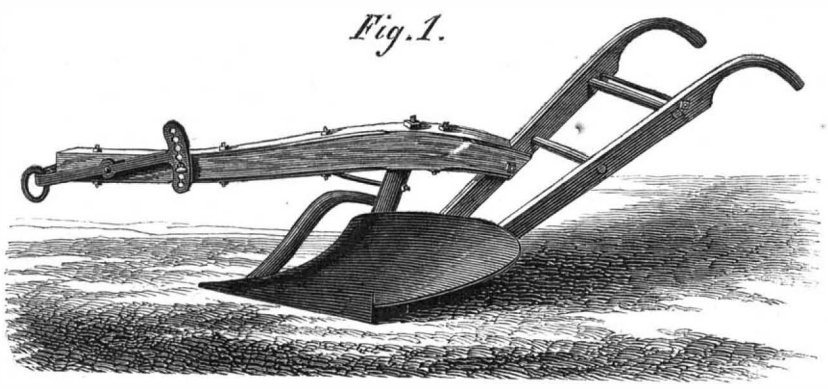
BARTLETT'S PATENT POWER MORTISER.

Improvement in Plow Clevis.

The object of this device is to afford a ready means of adjusting the pitch of a plow so that the depth of the furrow may be easily regulated and governed, as desired, by means of a vertical oscillating clevis attached by a pivot to the forward end of the plow beam.

Fig. 1 shows a plow with the adjustable clevis attached. Fig. 2, shows more clearly the construction and operation of the device. The clevis, A, is of U-shape, having one arm about one time longer than the other, the long arm having a segmental T-head, B, perforated with a series of united holes. The clevis is pivoted to the beam by a bolt passing through the beam and both arms of the clevis. The adjusting bolt C, having a handle at one end to be used as a wrench, is threaded at the other, and engages with a nut sunk into the plow beam. That portion of the bolt directly under its handle fits accurately the holes in the segment, holding the device firmly. In Fig. 2 the full and dotted lines taken together represent the form of the clevis and its positions. It may be made either of wrought or malleable cast iron, and can be used on all sizes and description of plows, while the cost is no more than that of any other clevis.

Patented by Jacob Newhart, Oct. 29, 1867. All communications should be addressed to Newhart & Co., Terre Haute, Ind.



NEWHART'S PATENT ADJUSTABLE CLEVIS.

How Kid Gloves are Made.

From an interesting article in *Harper's Magazine*, describing the process of manufacturing kid gloves, employed in the large European establishments, we make the following extracts, believing that the information will be acceptable to our readers:

"The skins of the young kid, after being roughly dried in the sun and air, are sold to peddlers who go about from place to place gathering them, in order that the latter may in turn sell them to dealers in the principal towns adjacent to the mountain ranges. These peddlers commence this work in Italy as early as March in each year, and proceed northward as far almost as the Baltic, as the season advances and the young kids reach their required maturity. The most important point for obtaining skins in Italy is Naples. Leipsic, in Germany, is also one of the considerable markets. The extent of the trade may be inferred from the fact that a single manufacturer of gloves in Paris makes about 600,000 pairs annually. He leaves no market in Europe unexplored to obtain the best material for the manufacture of gloves. The price of skins—such is the growing demand—has advanced nearly 50 per cent in the last five or six years.

"The process of cleansing the inner portion of the skin from fleshy impurities, of reducing the thickness when necessary by paring or scraping, and of removing the hair after it has been soaked in a solution of lime and water, or otherwise prepared, is very much the same as with other light skins. After expelling the lime, which has already performed its service, the skin is converted into soft leather for gloves by subjecting it to a solution chiefly of alum and salt. The skins, immersed in this emulsion, are trampled upon with bare feet until they become thoroughly impregnated with the liquid. They are dried, and also rubbed and stretched to make them smooth and supple, and portions are bleached—the object of these several processes being to render them incapable of the decomposition to which they are liable in their natural state, and to make the leather soft, pliable, and partially impervious to water

"Some of the manufacturers in France perform this work, as well as that of dyeing, in their own establishments, so as to be certain to command a large trade, but others buy the skins already prepared.

"For the purpose of coloring, the liquid dye is made in a kind of tub, attached to which is a sloping rest composed of wood, on which the leather—for such it has become—is fastened so as to permit the ready application of the dye to its outer surface by smearing, which is done by the hand, with the aid of a brush. If it were immersed, the inner portion of the glove would receive the dye as well as the outer, and stain the hand. The best leather is that dyed black, or of some other dark color, as only those skins are used for these colors which are free from imperfections on the surface. The dye does not penetrate beyond the mere exterior, and such imperfections as become visible when the glove is stretched—in the nature of a slight opening—are more obvious when the color is dark, and hence skins of poorer texture are used for white kids, which are known to be more flexible than others. The number of shades communicated in dyeing these leathers is about two hundred, gloves of any one of which will be furnished to a large customer who sends his orders in advance of their manufacture. Nearly all the diversity in the colors of flowers and plumage of which we know is presented, to afford gratification to the sense of pleasure occasioned to the wearer by their appropriation and display.

"Large dealers in gloves usually keep on hand a book of sample colors, in which small pieces of colored leather are arranged in the order in which the respective shades vary, each being numbered so as to correspond with a like book retained by the manufacturer, to which reference is made in giving and filling orders.

"The leather, thus tanned and dyed, is cut up into small rectangular pieces, and then stretched to the length and width of the proposed glove — the process being accomplished by holding each extremity of it in the hand and straining the piece gradually over a metallic edging fashioned for the purpose. A small metallic plate, furnished with sharp points arranged according to the shape of the hand, is then pressed on the leather, so that the latter may be cut into the shape and size which the points indicate. The person who does this—or some other if the business is on a large scale—follows with his scissors the slight indentations in the leather, which show the line for each finger and the position of the thumb. Others are engaged in cutting out thumbs, and still others in fashioning the gores, portions of which are cut out of the small pieces which remain when the chief parts of the glove are formed. There are ten different sizes for ladies' gloves—5¾, 6, 6¼, 6½, 6¾, 7, 7¼, 7½, 7¾, and 8; thirteen for gentleman—7½, 7¾, 8, 8¼, 8½, 8¾, 9, 9¼, 9½, 9¾, 10, 10¼, and 11; and seven for misses—5, 5¼, 5½, 5¾, 6, 6¼,

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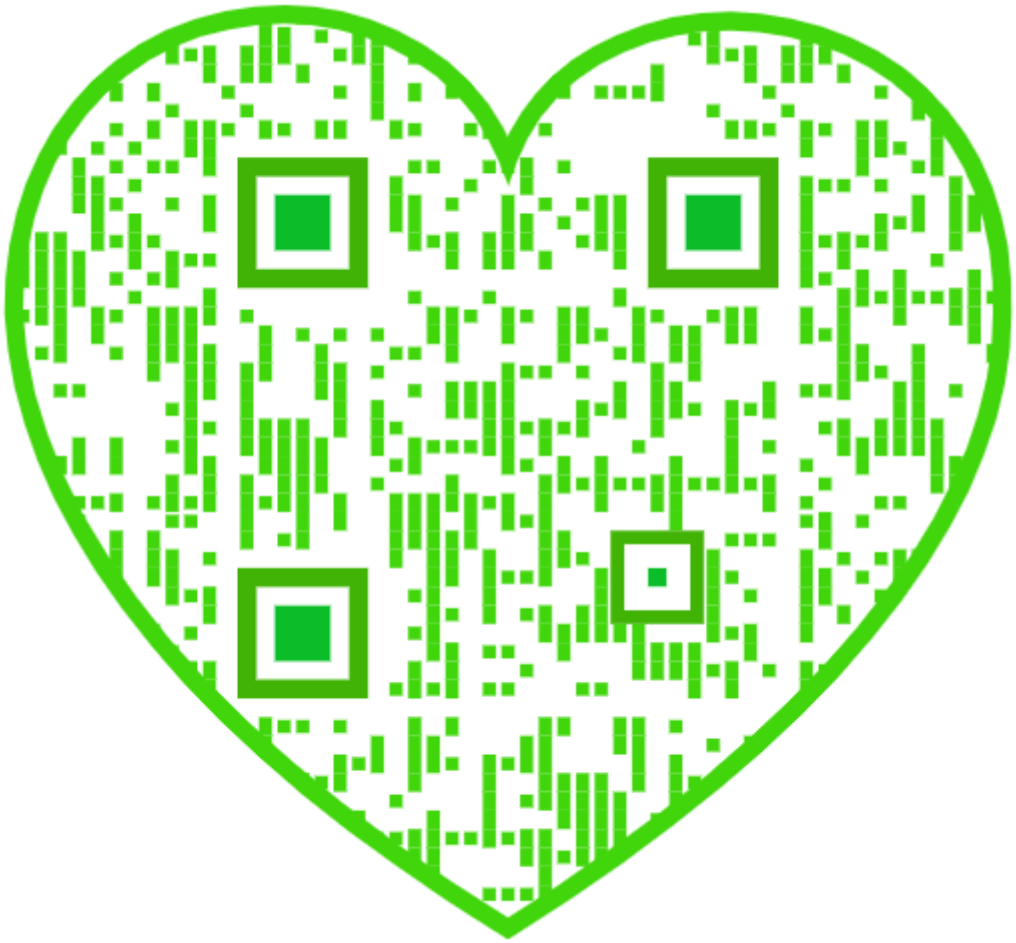


and 6½. The numbers in each class indicate a different size, those of gentlemen being longer in the fingers and higher in the wrists than are those of ladies of like numbers; though they are alike in width, and the misses' gloves are narrower than either. Each of these sizes is cut in the manner above mentioned by the points of a corresponding plate. Great care is exercised in securing uniformity of shade and texture in the various parts of a pair of gloves, although close scrutiny sometimes shows the wearer a slight difference.

"The gloves being cut, and all the parts supplied except the button or other fastening, or some ornament, they are tied together in bundles of a dozen each, and distributed over Paris and adjacent convenient towns for the purpose of being sewed. The families that do the sewing have scarcely any other industry, except that which appertains to their own households, or, if in the country, to their rural establishments, and occupy the intervals when not otherwise employed in these duties in sewing gloves. The amount paid for each pair—which is only about ten cents—would scarcely maintain those who devoted themselves exclusively to the work. The sewing is generally done by hand, but the parts to be united are held in a metallic clamp, the edges of which are regularly notched as a guide for the needle; and so accustomed do the women become to their work that, although the notch is very slight, they are able to reach it with the point of the needle with such accuracy as to give to the stitch the appearance of having been made with machinery, and this without keeping the eyes upon the work. Each stitch is now held with a knot to prevent ripping—a fault until recently common to gloves."

The addition of buttons, fastenings, and ornaments, and the final collection of the finished gloves into bundles of a dozen each, ready for market, are processes too simple to need special mention. For a description of the manufacture of American kid gloves, see page 242, Vol. XI., Scientific American.

CURIOUS APPLICATIONS OF ELECTRICITY.

Robert Houdin, the greatest *prestidigitateur* of modern times, lives in a charming mansion called the "Priory," in the village of Saint Gervais, upon the right bank of the Loire, about one and a half miles from the city of Blois. His dwelling, with the spacious grounds surrounding it, are believed by the common people of the vicinity to be controlled by some mysterious agent; and in their eyes the owner has an almost supernatural reputation. This impression has doubtless been produced, in no small measure, by the fact that M. Houdin has made extensive use of electricity to accomplish very many remarkable, and at the same time useful results. Some of these are exceedingly ingenious.

The main entrance to the Priory is a carriage-way closed by a gate. Upon the left of this is a door for the admission of visitors on foot; on the right is placed a letter-box. The mansion is situated a quarter of a mile distant, and is approached by a broad and winding road, well shaded with trees.

The visitor presenting himself before the door on the left, sees a gilt plate bearing the name of Robert Houdin, below which is a small gilt knocker. He raises this according to his fancy, but no matter how feeble the blow, a delicately tuned chime of bells, sounding through the mansion, announces his presence. When the attendant touches a button placed in the hall, the chime ceases, the bolt at the entrance is thrown back, the name of Robert Houdin disappears from the door, and in its place appears the word "entrez," in white enamel. The visitor pushes open the door and enters; it closes with a spring behind him, and he cannot depart without permission.

This door in opening sounds two distinct chimes, which are repeated in the inverse order in closing. Four distinct sounds, then, separated by equal intervals, are produced. In this way a single visitor is announced. If many come together, as each holds the door open for the next, the interval between the first two and the last two strokes indicates with great accuracy, especially to a practiced ear, the number who have entered; and the preparation for their reception is made accordingly. A resident of the place is readily distinguished; for, knowing in advance what is to occur, he knocks, and at the instant when the bolt slips back he enters. The equidistant strokes follow immediately the pressing of the button. But a new visitor, surprised at the appearance of the word "entrez," hesitates a second or two, then presses open the door gradually, and enters slowly. The four strokes, now separated by a short interval, succeed the pressing of the button by quite an appreciable time, and the host makes ready to receive a stranger. The traveling beggar, fearful of committing some indiscretion, raises timidly the knocker; he hesitates to enter, and when he does, it is only with great slowness and caution. This the chimes unerringly announce. It seems to persons at the house as if they actually saw the poor mendicant pass the entrance; and in going to meet him they are never mistaken.

When a carriage arrives at the Priory, the driver descends from his box, enters the door by the method now described, and is directed to the key of the gate by a suitable inscription. He unlocks the gate, and swings open its two parts; the movement is announced at the house, and on a table in the hall, bearing the words, "The gate is ——" appears the word "open" or "closed," according to the fact.

The letter box, too, has an electric communication with the house. The carrier, previously instructed, drops in first all the printed matter together; then he adds the letters, one by one. Each addition sounds the chime; and the owner, even if he has not yet risen, is apprised of the character of his dispatches.

To avoid sending letters to the village, they are written in the evening; and a commutator is so arranged that when the carrier drops the mail into the box the next morning, the electricity, in place of sounding the chime in the house, sounds one over his head. Thus warned, he comes up to the house to leave what he has brought, and to take away the letters ready for mailing.

"My electric doorkeeper then (says Houdin) leaves me nothing to be desired. His service is most exact; his fidelity is thoroughly proven; his discretion is unequalled; and as to his salary, I doubt the possibility of obtaining an equal service for a smaller remuneration."

M. Houdin possesses a young mare, whom he has named Fanchette. To this animal he is much attached, and cares for her with the greatest assiduity. A former hostler, who was an active and intelligent man, had become devoted to the art so successfully practiced by his employer in previous years. His knowledge, however, was confined to a single trick, but this he executed with rare ability. This trick consisted in changing the oats of his master into five-franc pieces. To prevent this peculation, the stable, distant from the house seven or eight rods, is connected with it by electricity; so that by means of a clock fixed in the study, the necessary quantity of food is supplied to the horse at a fixed hour, three times a day. The distributing apparatus is very simple, consisting of a square box, funnel-shaped, which discharges the oats in the proportions previously regulated. Since the oats are allowed to fall only when the stable door is locked, the hostler cannot remove them after they are supplied; nor can he shut himself in the stable, and thus get the oats, as the door locks only upon the outside. Moreover, he cannot reënter and abstract them, because an alarm is caused to sound in the house, if the door be opened before the oats are consumed.

This study clock transmits the time to two dial-plates. One, placed upon the front of the house, gives the hour of the day to the neighborhood; the other, fastened to the gardener's lodge, facing the house, gives the time to its inmates. Several smaller dials, operated similarly, are placed in the various apartments. They all, however, have but a single striking part, but this is powerful enough to be heard over the entire village. Upon the top of the house is a tower containing a bell on which the hours of meals are announced. Below this is a train of wheel-work to raise the hammer. To avoid the necessity of winding up the weight every day, an automtic arrangement is employed, which utilizes a force ordinarily lost. Between the kitchen, situated upon the ground floor, and the clock work in the garret, there is a contrivance so arranged that the servants in going to and fro about their work, wind up the weight without being conscious of it. An electric current set in motion by the study regulator, raises the detent, and permits the number of strokes indicated by the dial. This manner of distributing the time from the study, Houdin finds very useful. When, for any reason, he wishes the meals hurried or retarded, he presses a secret key, and the time upon all the dials is altered to suit his convenience. The cook finds often that the time passes very rapidly; while a quarter of an hour or more, not otherwise attainable, is gained by M. Houdin.

Every morning this clock sends, at different hours, electric impulses to awaken three persons, the first of whom is the gardener. But, in addition, the apparatus forces them to rise, by continuing to sound until the circuit is broken by moving a small key placed at the further end of the room. To do this, the sleeper must rise, and then the object sought is accomplished.

The poor gardener is almost tormented by this electricity. The greenhouse is so arranged that he cannot raise its temperature above 10° C. (50° F.), or let it fall below 30° C. (37° F.) without a record in the study. The next morning Houdin says to him, "Jean, you had too much heat last night; you will scorch my geraniums;" or, "Jean, you are in danger of freezing my orange trees; the thermometer descended to three degrees below zero (27° F.) last night." Jean scratches his head and says nothing, but he evidently regards Houdin as a sorcerer.

A similar thermo-electric apparatus placed in the woodhouse, gives warning of the first beginning of an incendiary fire.

As a protection against robbers, all the doors and windows of the house have an electric attachment. This so connects them with the chime that the bells continue to sound as long as the door or window remains open. During the day time, the electric communication is interrupted; but at midnight—the hour of crime—it is reëstablished by the study clock. When the owner is absent, however, the connection is permanent. Then the opening of a door or window causes the great bell to sound like a tocsin. Every body is aroused, and the robber is easily captured.

A pistol-gallery is upon the grounds, and Houdin often amuses himself in shooting. But in place of the ordinary method of announcing a successful shot, a crown of laurels is caused to appear suddenly above the head of the marksman.

A deep road passes through the park, which it is sometimes necessary to cross. On reaching it, no bridge is to be seen; but upon the edge of the ravine, a little car appears, upon which the person desiring to cross places himself. No sooner is he seated than he is rapidly transported to the opposite bank. As he steps out, the car returns again to the other side. This being a double-acting arrangement, the same aerial method is made use of in returning.

"I finish here my description," says Houdin. "Ought I not to reserve some few and unexpected details for the visitor who comes to raise the mysterious knocker, below which, it will be remembered, is engraved the name of Robert Houdin?"—*College Courant (Yale)*

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Solder Drops.

Messrs. Editors:—In looking over some back numbers of the Scientific American, I noticed a patent plate or mold for casting "solder drops," and it occurs to me that a process used by me for accomplishing the same result might be of use to many of your readers.

I am a practical tinsmith, and have never yet met with any one who was in possession of the secret, except the person who taught me, and it has always been a source of wonder to all who have witnessed the process. It consists simply in pouring the melted solder into cold water, and the whole secret is in pouring it at as low a heat as possible and have the metal run. Pour a steady stream about one-eighth inch in diameter, holding the lip of the melting cup about two or three inches from the water.

Inclosed with this I send samples of the "drops," which you will see are of the most convenient shape possible for tinsmiths' use.

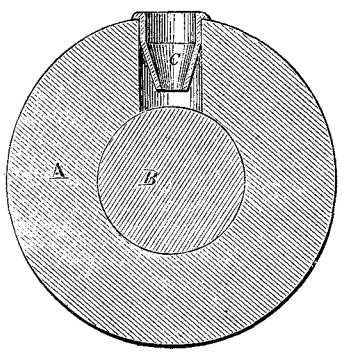
N. F. Blackman.

Tomah, Wis.

[We append a sketch of one of the "drops," of which our correspondent has sent a number, uniform in size and shape. The sketch is of full size, and the form appears to be admirably adapted to several varieties of tinman's work.—Eds.

Waste of Oil--Loose Pulleys.

Messrs. Editors:—In your paper of the 8th of February is an article on the waste of oil in shops and manufactories, which is of more value than the price of your journal. Therefore I desire to contribute something upon the same subject which may be of some use to a portion of your readers. One great source of waste of oil in shops and factories is to be found in the loose pulleys. The oil holes are left open, and when the machinery is in motion the oil is thrown out, saturating the belts and soiling the machines. This can easily be prevented by having conical-shaped tubes, made of sheet metal fitted in the oil holes. By the annexed diagram, which is a section of a pulley hub cut through the oil hole and tube, it will be seen that the oil cannot run out, but will lodge in the space between the sides of the hole and tube, and of course the pulley will not require oiling so often. The tube must fit the entrance tight. No plug is needed, and all further waste and annoyance is ended. Samuel



Philadelphia, Pa.

[A is the section of the pulley hub, B the shaft, C the sheet metal tube inserted in the oil hole. The device is so simple that no mechanic can fail to understand it, and it appears to be just what is needed.—Eds.

Self-adjusting Telegraph Magnet an Impossibility.

Messrs. Editors:—Seldom or never does the manipulating key break the *whole* of the electric current on a line of telegraph, frequently but a small portion of it; hence, communication is effected by a variation in the strength of current. But variations arise from other causes, and these changes are sometimes greater than those produced by the act of sending messages. Therefore, a self-adjusting magnet must be one that will obey changes of current, no matter how slight, when made by the operator, but will refuse to act from accidental changes, however great; in other words, it must have the power of discriminating between causes of variations in strength of current. As no magnet can do this, a self-adjusting one is an utter impossibility. As long as any thing but the key varies the force of the current, the operator will have to do his own "adjusting." S.

Aspinwall, New Granada.

Improvement in Hand Printing Presses Wanted.

Messrs. Editors:—I notice every week, in the Scientific American that almost every third patent is a washing machine, churn, or animal trap. Why do not the ingenious men of our country turn their attention to the printing office, and the wants of printers. Hundreds of patent *steam presses* (printing) are made each year, but where there is one office that can afford one of these machines there are twenty that cannot. The hand press has never been changed for the better. As at present made, it is too clumsy, and the old-fashioned tympan is constantly becoming slack and wearing out, and then comes the laborious re-covering. There is a nice fortune awaiting the man who will improve upon the hand printing press, and give country printers a machine they can afford to buy. The machine presses for newspapers, as now constructed, cost more (each) than four fifths of the country offices are worth. Won't you call the attention of inventors to this need, and if you succeed in awaking a slumbering genius, you will receive the thanks, I am sure, of all country printers, and you know they are no small class in the United States. W. A. Gabe.

Bloomington, Ind.

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Steam Expansion---The Vacuum

MESSRS. EDITORS :—On page 52, No. 4, Vol. XVIII., I notice an article entitled "Steam Expansion" in which the writer labors under a great mistake; for his statement that "any good engine working steam to a quarter of stroke, cutting off and expanding to near half stroke, will form a vacuum on the steam side of the piston the remainder of the stroke," is not in conformity with practice.

The experiments of M. Regnault upon this subject have been very elaborate and very carefully conducted, and the result of his investigations shows that the temperature of steam does not increase as fast as the pressure does and that the sum of the latent and sensible heats do not form a constant quantity. Steam of 14·7 pounds pressure to the square inch has a temperature of 212°, while in steam of 75 pounds pressure the sensible heat is 304° and the latent heat 901. Expand this 75 pounds of steam to double its bulk, which would bring its pressure down to 37½ pounds, and its sensible heat to 264° instead of 152, while its latent heat would be 928°. From this it will be seen that the sensible heat increases slightly with the pressure while the latent decreases for in steam of 100 pounds the sensible heat is 327·8° and latent heat 886·1°, total 1213· 9°; expand this to 15 pounds and the sensible heat will be 213·1°, the latent 965·8°, total 1178·9°, which makes a difference of 35°.

Bourne states that if steam of 100 pounds be expanded down to 15 pounds, it will have 35 degrees of heat over that which is required to maintain the vaporous state, or, in other words, it will be surcharged with heat, but I think differently. Your correspondent makes the remark that a small percentage of air mixed with steam in a high pressure engine helps its expansion. I do not think it would be any advantage to do so for the power that would be required to move machinery to do this, would be more than the benefit gained therefrom.

F. A. WISWELL.

Lenoxville, Province of Quebec.

Latent and Sensible Heat.

MESSRS. EDITORS :—Will you or any of your correspondents inform me whether any of the latent heat of steam is converted into motion in passing through the steam engine? If sensible heat alone is converted into motion it is evident that the greater the pressure and consequently the sensible heat, the greater will be the return of power from a given quantity of steam. The sum of the latent and sensible heat of steam is always the same—1212° F. Steam under a pressure of 100 lbs. to the inch has a sensible heat of 332° or 365° of the entire heat contained in the steam. If this alone is available, may not this be the reason for the present imperfection of steam machinery? D. B. T.

Bellefontaine, Ohio.

[Steam loses heat precisely in proportion to the amount of force it gives out. The heat is converted into ordinary motion. Heat is force. If the sum of latent and sensible heat of steam be a constant quantity, then a loss of sensible heat without condensation to water requires an increase of latent heat.—EDS.

Science Familiarly Illustrated.

HEAT AND COLD.

BY JOHN TYNDALL, ESQ., LL. D., F.R.S.

Lecture V.

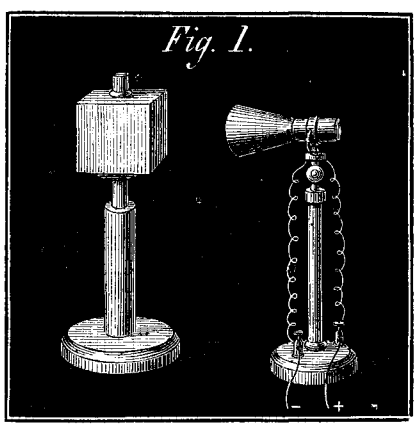
You know that towards the end of the last lecture I failed in the experiment of freezing water in a red-hot crucible by means of carbonic acid snow. As I do not like failures in experiments I will try to make that good. I have here some of this beautiful carbonic acid snow, which I will now put in this red-hot crucible. I will pour upon that a quantity of ether, and then I bring down into the middle of the mixture this hollow brass ball containing water. The ether is now boiling. I will put in some more of this carbonic acid snow. It burns my hand—it is so enormously cold. This ball is very cold, and I have no doubt that already there is ice in it. The quantities of the substances are much smaller than I have been accustomed to work with, but I dare say we shall succeed notwithstanding all our difficulties. [After a short interval the water was found to be frozen.] There! look at that. The water in this spheroid is converted into ice, even in this red hot crucible!

I have here some mercury, and I will pour some of it into this basin. I dare say we shall be able to solidify this mercury by means of this beautiful carbonic acid snow. Now observe here what I think you have never seen before. You know the liquid metal mercury. You have it here made solid —frozen by the cold acid. This requires a far greater cold than will freeze water. I might beat this substance on an anvil or cut it with a knife. It becomes liquid again in a moment. If I hold this solid frozen mercury in a vessel of water, the mercury will become liquid and fall, and each little drop of mercury which falls will produce a stalactite of ice. See, the frozen mercury is being melted by that water. This is really cold water, but it is hot to the frozen mercury, and a mass of ice is produced round about the mercury which has been cold enough to do that.

We have now to pass on to another and very different portion of our subject. I have endeavoured to give you a kind of image, more or less perfect, of this thing that we call heat. I have endeavored to give you a picture as it were, which your minds should realize.

If you take a hot body and place it in the air, you find that it gradually cools. If it be red hot the glow first of all sinks, and by and by you see nothing of it. The thing gets cooler and cooler, and at the end becomes as cool as the surrounding air. Now this heat, in the first instance, was a motion of the particles of the hot body. When the body cools it is simply giving up its motion. Now to what does it give up its motion when you place it in the air? Well you might say, to the air. True: and when I held the heated piece of iron in front of the screen you saw the hot particles of air streaming up into the air above; so no doubt the motion which the hot body gives up is given up to the air. But if you put the hot body in the middle of a place where air did not exist it would still cool. Now, I want you to exercise your imagination as to the manner in which this motion is disposed of, lost, or given out when a body cools. I believe most of you know how it is that sound travels through the air, at least, how it is that the sound of my voice propagates itself through the air and makes every word I say audible, I trust, to you all. I have often looked into persons' throats when they were speaking, and observed cords or tendons there which are thrown into a state of vibration when we speak or sing. They cause the air to shiver, and those tremors are propagated through it just as motion is propagated by ripples over the surface of water when a stone is thrown into it. So if I draw this violin bow across this tuning fork, you have this beautiful sound produced, I can actually see the fork vibrating being thus near it, and you can hear it tapping against this card. The whole function of a tuning fork is to throw the air into tremors, and these tremors communicated to the air, are the cause of sound. The tuning fork communicates its motion to the mass of air which surrounds it. The vibrations of this tuning fork gradually become less intense, and the sound which it makes gets lower. Now, that is exactly analogous to the cooling of a hot body. It communicates its motion to what is called the "ether," by means of which bodies which are hot communicate their motion to the universe around. You all hear my voice. The human ear is one of the most wonderful organisms in the universe. I often think the human ear is still more wonderful than the human eye. It is by virtue of this wonderful organ that you hear with perfect distinctness every word I am uttering; but it does not tell that this communication of motion is going on. I want to show you something that will. Instead of the ear I will take a flame, which I dare say will give me a very good result. Perhaps one of the boys will chirrup to that flame. Every vibration produced by the lips by the act of chirruping is communicated to that flame, and makes it dance in that peculiar way. The action of this flame is an illustration of the motion in the air produced by sound. This action of flames was discovered by professor Leconte, in the United States; and it has been worked at in this country by Mr. Barret and myself. Something passes through the air and knocks the flame down when you chirrup. The vibrations communicated to the air make the flame behave in this peculiar way.

We now come to consider the cooling of a body. I say that the act of cooling must be figured in a similar way to the action of a body producing sound. The cooling body is communicating its motion, not to the air, but to this wonderful thing called the ether. The radiation passing through the air might be called the radiation of sound; but when motion is communicated to this wonderful ether it is called the radiation of heat. To illustrate this we must employ this beautiful instrument with which you are already acquainted —the thermo-electric pile. I shall now unite the ends of these wires with this pile, and we shall observe by means of our magnetic needle whether the pile is heated or chilled. I wish I could have a warm cheek here, for every one of you here present is a radiating body, not luminous but radiating. [The lecturer then selected a boy from the audience, and led him to the lecture table.] I want to make my young friend here my radiating body. I will first chill the pile by turning it to the cool side of the room, and then bring the needle to rest by means of this magnet. The pile itself is now a radiating body, and hence you see the needle coming down. I will now try and extract heat from the cheek of my excellent friend here. He does not touch the pile. I will depend purely on the radiation of heat from his cheek, and I will venture to say that if his cheek is not chilled by the very cold weather, the needle will move up through an arc of 90°. Observe, now, the needle goes up in virtue of the heat extracted from his cheek. We will now direct the face of the pile against this comparatively polar region of the room, and allow it to waste its heat once more. Now the heat which has produced this effect on the pile is the radiant heat which I want to examine during the rest of the lecture.



I want to show you that various bodies possess the power of emitting this radiant heat in very different degrees. My friend's cheek was an admirable radiator of heat. There are various other bodies, however, much less admirable as radiators. To show this fact, I will take this cube. (Fig. 1). It is covered on three sides with velvet. One side has white velvet, one has scarlet velvet, and the other has black velvet, and this fourth side is a naked face of metal. I should like to make clear to you that these four sides of this cube possess the power of radiating heat in very different degrees; and for the purpose of showing you this I will fill the cube with boiling water. The sides of the cube will become equally heated by the hot water poured into the cube, and then I will allow them in succession to radiate against our thermo-electric pile. I dare say you will then see the distinction. I first bring the needle to zero by turning the face of the pile away from the audience; and now I place the cube of hot water on this little stand near the pile. I think you will agree with me that the outside of the metal side of the cube must be hotter than the velvet. You could feel this difference by placing your hand upon them. But still, I think the velvet will be able to produce a greater effect upon the pile than the metal surface. The metal side, you see, does not produce much effect upon the pile. Now I turn the velvet to the face of the pile, and you see that the needle goes up beyond the position it occupied when the metal side was there. I now turn the metal side back again, and the needle will go down. Now you see it going down; and when it has gone down a little more, I will turn the black velvet surface toward it, and you will see that the needle will go up again. Thus you see that the heat radiating from this velvet surface is much greater than the heat radiating from the metal; and we have from this fact a beautiful consequence which many boys would not think would occur. The consequence is this. If we filled with boiling water these two vessels, one of which is covered with a thick coating of flannel, and the other of which has naked sides of metal, and allowed them to rest here until the end of the lecture, and then put a thermometer in each to find out the temperature of the water, which vessel do you think would contain the coolest water?

Boys of the Audience: The metal one.

The Lecturer: You have not philosophized correctly upon the experiment I made with the cube. Your conclusion is the most natural one, but you saw that the quantity of heat sent away from the covered surface of the cube was greater than the quantity sent away from the uncovered surface. In the same way the quantity of heat from the radiating vessel coated with flannel would be greater than that radiating from the uncovered metal vessel, and therefore at the end of the lecture the water in the covered vessel would be three or four degrees cooler than the water in the other. In order that this difference should exist in favor of the covered vessel, it must be covered very closely; that it to say, the heat must communicate itself very freely from the surface of the metal to the flannel covering. If it were not covered closely the result would be different and the heat would be preserved. This is the reason why ladies who wish to keep their teapots warm, put over them a kind of nightcap, which they call a "cozey." This cozeymust, however, be loose about the teapot. If it were to fit very closely it would do more harm than good. However, if it does not fit tightly the heat radiates against the cozey, and the cozey prevents it from being radiated into space.

I have said that we find very great differences among substances in their power of radiating heat. Some are good radiators; some are bad radiators. The metals are all bad radiators. I now want to make plain to you another fact which goes hand in hand with this radiation. I think you will understand the experiment by which I want to illustrate this point. Here you see I have a metal surface which is a bad radiator. If that metal surface formed the side of a vessel containing hot water, it would radiate far less heat away than this surface which is coated with lamp black. A vessel coated as this surface is would cool the hot water in it far more rapidly than a vessel composed of naked tin. Now, observe that bodies have also different powers of absorbing or drinking in radiant heat, and as a universal rule the body that is a good radiator is a good absorber. Both actions are perfectly reciprocal the one to the other. I want to make this evident to you by means of a device; for in working in physical science we have incessantly to address questions, as it were, to nature, and we do that by means of experimental devices. And now I am going, in your presence, to ask nature the question which of these two surfaces absorbs and takes up the heat most speedily, most rapidly, and most effectually, if both be presented to a hot body—which of them, in fact, is the best absorber. The device that I want to employ in this experiment will be evident to you after a little attention on your part. Nothing is learned or nothing is understood without an act of attention on the part of the student; and if you do not think of these lectures afterwards, and read about the subject afterward—if you do not dwell upon what we say here, and work at the subject, and reflect upon it, these lectures will pass away from your memories, and make very little impression. In fact, these lectures are very little good except for the purpose of stirring you up, and giving you, as it were, the first taste of science. I really do not care much about lectures. I would rather have ten or a dozen boys working away with me in a room than be preaching to them as I am doing now. However, there is good to be done in this way if you will only think about the subject, and bring your own minds to bear upon it afterward.

FUSION OF GLASS.—Herr C. Sching has shown, by the application of the thermo-electric pyrometer, that the temperature of a glass furnace in operation is only from 1,100° to 1,250° C. Crystal glass becomes completely liquid at 929° C., and is worked at 833°. A Bohemian glass tube softens at 769° and becomes liquid at 1,052° C. Pure limestone loses its carbonic acid by heating for several hours at 617 ° to 675° C. The gas can be driven off more rapidly by increasing the temperature.

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Why Men Like to Drink.

[The following article from the pen of Horace Greeley we copy from the *Herald of Health*, a journal which contains more sensible articles on subjects of a practical moral bearing, than are to be found in any other monthly that comes to our sanctum.]

The Greek root of the word intoxicate means poison. Whoever says a man is intoxicated, says he is poisoned. And it is true. Give a part of a glass of ordinary spirits to a child three or four years old, and the child is in twenty minutes in a congestion fit, and probably dies. It operates precisely like strychnine. arsenic, or any other deadly drug. Commence by giving a child a thimbleful at a time, and gradually increase the amount, and you may indurate him so that he will swallow as much at a time as would kill him at first. You may begin with any other poison, and do the same thing. Our physical framework is constructed with reference to this, to enable it to stand a large amount of any deadly substance. There is nothing peculiar in this action of alcohol. There is nothing in this but the universal law that all poisons destroy the susceptibility of the human frame.

Why does a man like to drink liquor? Not because it has a good taste, but because it exhilarates his nervous system. The man takes his first glass of liquor. It goes to his stomach. Now, there is not a single human stomach, nor that of any animal ever created on this earth, that ever did or can digest a drop of alcohol. The moment it falls into the stomach every vital organ recognizes the presence of a deadly enemy. It is precisely as if a lion were thrown into a cage of tigers, and every tiger were to recognize the lion as his deadly enemy. The stomach cannot digest it, and it cannot remain. All the organs assist in throwing it off, and that great struggle of every vital organ to rid the stomach of this poison is the very thing which the perverted senses recognize as *exhilaration!* If a man, standing on the moon, could have a telescope of sufficient power to enable him to view objects on the earth, and could have looked upon us during the late civil war, and have seen, dimly through the glass, the movements of immense bodies of men, he would have said, "This nation has an immense population; there is a tremendous outpouring of the people; this nation is in a state of extraordinary prosperity." Precisely so the man's sensorial, the point where the nerves of sense concentrate, recognizes, in this desperate effort of the vital organs to get rid of an enemy, a sense of strength and exhilaration in place of the languor and feebleness he felt just before. But in a little while, when nature has, by all her efforts, disposed of this poison, the man sinks down to his former condition, and a great deal below it. Nature has made her superior struggle; she has got rid of the poison; but she has tired herself in the effort. The next time Nature makes the same struggle, but she has not the same strength. The second glass does not make the man feel so good. The more a man drinks, the more he has to drink to attain a certain condition. He has to take more and more. Nature turns constantly to rid herself of it, but by and by becomes tired out and gives it up. There are men who are not very perceptibly affected by liquor. It does not make them drunk. It does not hurt them, they say. But it does hurt them. I never knew a man who drank a good deal without becoming intoxicated, whom liquor did not kill fast. And for physiological reasons. If a man will take poison, it is better to get rid of it than to keep it in the system. Drunkenness is one of God's infinite mercies, sent to help poor, mistaken, human beings to get rid of the consequences of their iniquity.

What we should do depends largely upon what we are able to do. It is not easy to fly in the face of public opinion. Laws will, after all, be mainly a reflection of the moral condition of the people. They will always be a little better, but not much better. If you should say that no one in the country should do a bad thing, it would be useless, because human nature, in the development to which we have reached, would not sustain such a law. Public sentiment is advancing. It does not allow men to make a parade of vices which were once tolerated. The time will come when men will not be licensed to sell alcoholic liquors, when grogshops will be where gambling-houses are now, out of sight.

Improved Process of Bleaching Cloth, Yarn, etc.

By Wheaton Luther, of Niagara Falls, N. Y., recently patented:

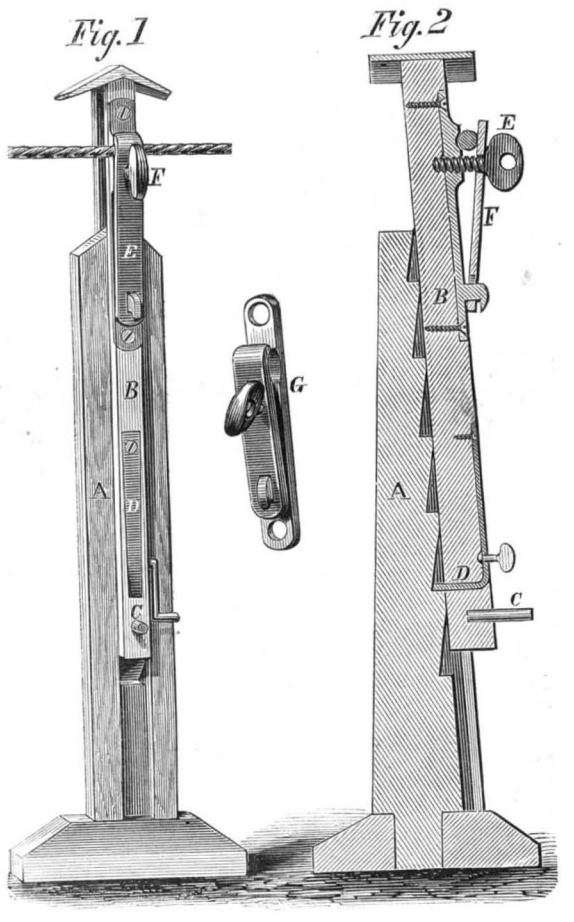
"First boil the article in common lime water, whose strength is from two to four degrees, an hour or hour and a half, depending principally upon the size of the piece. It may be soaked in cold lime water instead of boiling, but moderate boiling hastens the process, while severe boiling may damage the article. Next rinse the article thoroughly, for five minutes or more, in clean water, cold or hot, and immediately immerse in a dilute acid, muriatic or sulphuric, although I greatly prefer the latter, whose strength is about one degree, until it thoroughly permeates the article—say about half an hour. Then remove it, and without rinsing —and even squeezing is unnecessary—immediately, while it is thoroughly saturated with acid, immerse it in the bleaching liquid, chloride of lime or hyperchloride of magnesia, whose strength is about two or three degrees, and the bleaching will proceed very rapidly. In ordinary cases it will take from fifteen to thirty minutes to bleach thoroughly. The article is then removed, and without rinsing is immediately immersed in the dilute acid before mentioned for a few minutes, say five or ten, and the process is completed, and the article is thoroughly washed and rinsed.

"Having explained the process I will now proceed to explain the chemical action, so far as to enable others skilled in the art to understand that the process is a rational one. Boiling in lime is not new, but by treating it in acid according to my process, it is unnecessary to keep it in as long as by other known processes. After boiling, the lime is thoroughly washed or rinsed out, and this is the only washing or rinsing that is necessary during the whole process. The lime is supposed to start the color, and the acid continues the process. One of the essential features of this process is immersing the article in the bleaching liquid while it is thoroughly saturated with the sulphuric or other acid, thus causing the chlorine to be set free the instant that it comes in contact with the article bleached, whereas by other known processes the chloride of lime remains in contact with the article several hours, and rots or weakens it. It is better to have an excess than a deficiency of the acid, for it will set free the chlorine and prevent its preying upon the fiber; hence squeezing out the acid before the article is put in the bleaching liquid is unnecessary, and might prove detrimental. The acid used in my process is so dilute that it tends to strengthen the fiber, and it remains in contact with the bleaching powder so short a time that it comes out of the process as strong as it went in. The last immersion in the acid is to set free the chlorine, should any remain in the article after it has been removed from the bleaching powder. If the acid be sufficiently weak, the last immersion may be prolonged to a quarter or half an hour, without detriment to the process. By the process herein described I am able to bleach thoroughly in three or four hours."

DITTENHAVER'S ADJUSTABLE CLOTHES LINE POST.

The improvement exhibited in the engravings is intended to prevent the overreaching frequently necessary in hanging out clothes, which is so detrimental to the health of woman, and to afford a ready means of stretching or taking in the line, and appears to be well adapted to both these purposes.

Fig. 1 is a perspective view of the contrivance, and Fig. 2 a central vertical section. A is a post or beam set firmly into the ground or otherwise secured to an immovable base, and



having a longitudinal groove running through it on one side the bottom of the groove being cut into ratchet teeth, Fig. 2. The extension post, B, slides in this groove, being lifted to the hight required by the handle, C, and held in place by the spring catch, D. A clamp, E, hinged to a projection on a plate set into the post secures the line firmly by means of a thumb screw, F. The clamp, plate, and screw are shown enlarged at G. A cap on the top of the movable post serves to protect the metals and joints from injury by the weather.

Patented through the Scientific American Patent Agency, January 7, 1868, by George Dittenhaver, who may be addressed at Napoleon, Ohio.

Test your Kerosene.

In view of the many lamp explosions resulting almost invariably from the use of bad kerosene we urge upon the heads of families the importance of testing their oil before use in the lamp. This may be readily done by any man, woman, or child, by means of a thermometer, a little warm water and a tablespoonful of the oil. Fill the cup with warm water, the temperature of which is to be brought to 110° Fah. Pour the oil on the water; apply flame to the floating oil by match or otherwise. If the oil is unsafe it will take fire, and its use in the lamp is dangerous, *for it is liable to explode.* But if the oil is safe and good it will not take fire.

All persons who sell kerosene that will not stand the fire test at 110° are liable to prosecution.

DURING the germination of seeds and the growth of plants negative electricity is generated and becomes free in the air Pouillet has estimated that a surface of 100 square yards covered with vegetation, disengages in a day more electricity than is required to charge the most powerful Leyden battery,

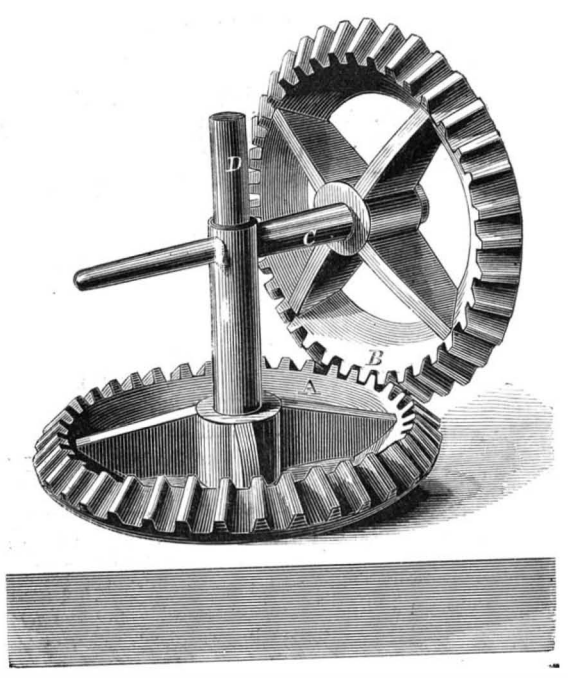
TURNING A MOVABLE WHEEL AROUND A FIXED WHEEL.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter?"

This discussion continues with unabated interest, and we are in the receipt, from all parts of the country, of communications upon the subject, some of which are of an exceedingly curious nature. One of our enterprising correspondents brings the matter to a very practical focus. He is connected with the Secombe Manufacturing Co., on Broad way, makers of Holt's patent Marking Wheel. This is a very ingenious and effective contrivance for printing business cards upon all sorts of surfaces, plane or curved. It consists of a handle carrying a printing wheel, around which a plate of flexible printing types is secured, and whenever the wheel rolls over a given surface a print is made. One of the common uses for which this instrument is now employed all over the country is to stamp the curved surfaces of pails, firkins, cylinders, bottles, fixed wheels, etc., and in many cases the fixed wheel or cylinder is of precisely the same diameter as the rolling printing wheel. Our correspondent assumes that this wheel turns only once on its own axis in rolling once around a fixed wheel of the same diameter; he extends a cordial invitation to all the two-revolutionists to visit his place of business and try the thing for themselves; to all who can show that the wheel makes two revolutions he offers to present one of the printing instruments valued at $10. This is practical, and is, moreover, a *bona-fide* offer. We trust that "L. M.," W. E. H., Prof. Hepburn, Prof. Vander Weyde, Prof. Jackson, the *Newburyport Herald*, Capt. Goodwin, A. W. B., and all the geometrical, astronomical, mathematical, mechanical, and all other two-revolution philosophers will call on our correspondent, demonstrate their theory and carry away the proffered prizes. Hundreds of the rolling wheels are there waiting for them, with any quantity of fixed wheels upon which to try the experiment. In the meantime we publish the letter of our correspondent with diagram of the instrument; together with sundry other letters and illustrations of the general subject.

We have heretofore stated that in the rolling of the wheel around the fixed wheel, a compound motion was produced, and that the rolling wheel turned once on its own axis, and once around the center of the fixed wheel. We give an illustration:

Fig. 11.



Here we have a fixed wheel, A, and a movable wheel, B, of the same diameter; and we say that the moving wheel turns *once on its own axis* in rolling once around the fixed wheel. We should be glad if the two-revolution philosophers would examine and tell us explicitly, whether, in the above example, the moving wheel makes *one* or *two* revolutions upon its own axis, in rolling once around the fixed wheel.

In Figure 11, the two motions produced by the rolling wheel, namely, one revolution upon its own axis, and one rotation around the center of the fixed wheel, are readily seen. In a working model the practical effect of both of these movements may be separately transmitted. For example, if a cord is attached to the shaft, C, it will be wound once for each rotation of B around A. If another cord is attached to D, it will also be wound once for each rotation of B around A.

There are various forms of devices by which the effect of both of these motions are combined and may be transmitted to one cord, in which case such cord will be caused to wind twice for each rotation of the moving wheel upon its own axis. Many of the two-revolution philosophers depend upon devices of this character for the practical illustration of their views; and they assume that the rolling wheel turns twice upon its own axis in rolling once around the fixed wheel, because the cord turns twice, or a pointer turns twice.

But in all of the models and devices that have thus far been presented to us for examination in proof of the two-revolution position, we find the same double motion that we have illustrated in Figure 11; and in all of these models, if we so arrange the cord that it will be relieved from the effect of the central motion, then only the actual rotation of the movable wheel upon its own axis is transmitted, and the

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cord will be wound but once for each rotation of the moving wheel around the fixed wheel.

Our friend L. M. whose original diagram gave impetus to the discussion, appears again as follows:—

MESSRS. EDITORS:—In the progress of this discussion it is increasingly manifest that the variance in the views of your correspondents arises, mainly, from the variant meanings we attach to one or more words and phrases. Under this impression I recently addressed to certain friends of mine a simple but very pertinent question, to which, aside from their characteristic courtesy, they failed to respond. I must, therefore, without their coveted aid, offer you some notions of my own.

I would ask of all who take an interest in the question to concur with me in simplifying it, by confining our attention to those points alone that are essential to a competent understanding and correct solution of it. This will exclude all side issues that would confuse or mislead.

The question is a simple one:—"How many revolutions on its own axis will a wheel make in rolling once around a fixed wheel of the same size?"

The machinery thus indicated consists of two wheels of same size, one of them fixed and the other free, the fixed wheel and all the movements of the other being restricted to one and the same plane. *This is all.* And we must refuse the introduction of lines, pins, axles, or anything else. They are not needed.

A. The axis, contemplated by the question, is located in the center of the wheel, and is a geometric or imaginary line, having length, without breadth or thickness. Therefore, to speak of a revolution of the axis itself is absurd.

B. A "revolution on its own axis" means such a movement of a rolling wheel as causes a right line drawn through its center to point successively to every surrounding point in the plane of motion, and every particle of its mass to pass once on every side of its axis, no matter to what extent or in what direction the axis itself may move.

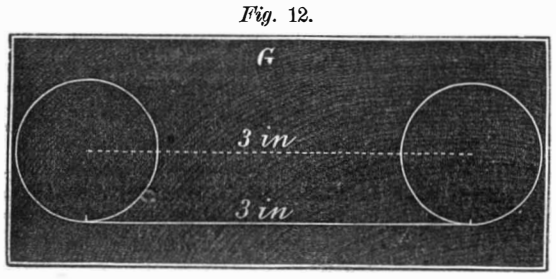
C. The distance traveled by a wheel is determined by, and is equivalent to. the length of the path of its axis, whether curved or rectilinear.

D. Roll a wheel over a right line of the length of its own circumference, and the path of its axis will be of the same length; but less if the line rolled over be concave, and greater if the line rolled over be convex, the extent of these differences being governed by the elements of the respective curves.

E. Divide the length of the path of the axis of a rolling wheel by the length of its circumference, and the quotient will be the number of revolutions made by the wheel around its own axis.

EXAMPLES.—Take a wheel one inch in diameter—its circumference three inches:

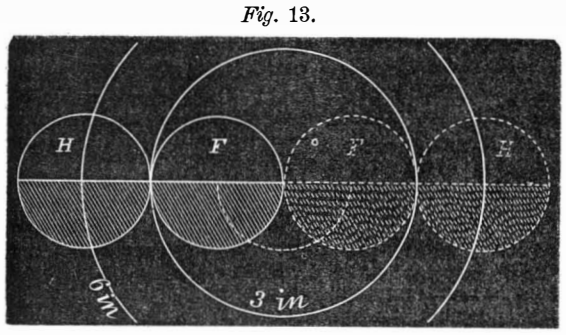
Fig. 12.



G. Roll it 3 inches over a right line, and the path of the axis will be 3 inches. Then 3 divided by 3 equals 1 revolution on its axis.

F. Roll it 3 inches over the concave surface of a curve of 2 inches diameter, and the path of the wheel's axis will be 1½ inches. Then 1½ divided by 3, equals ½ a revolution on its own axis. [It would thus make one entire revolution on its own axis, if the curve were a complete circle.—EDS.]

Fig. 13.



H. Roll it once around the convex surface of a wheel of same size, and the path of its axis will measure 6 inches. Then 6 divided by 3, equals 2 revolutions around its own axis.

This last example, I contend, furnishes the correct answer to the question at issue.

The foregoing paragraphs, marked A to E, are submitted merely as postulates. Should they be accepted as truths (and I have no doubt of their being such), the conclusive force of their application, in the examples F, G, and H, seems to me irresistible. I will gratefully welcome a frank exposition of anything erroneous in them, and will as frankly acknowledge it, if I cannot show the objection to be groundless. But I must be allowed to deprecate a naked assertion of dissent, unaccompanied by an explanatory why or wherefore.

L. M.

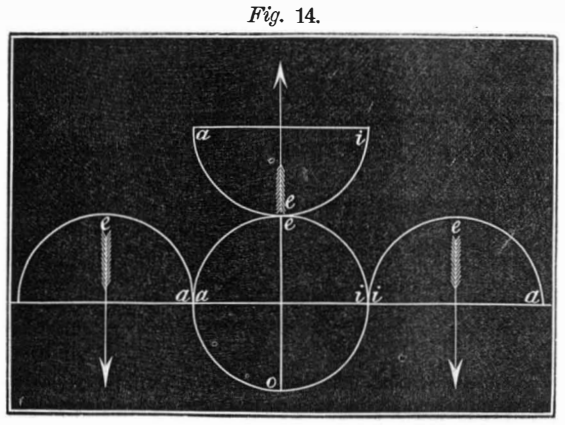
Germantown, Phila.

If we were to assent to L. M.'s list of postulates, we fear that some of the other two-revolution philosophers will want us to adopt the differential and integral calculus, together with the seven books of Euclid, as a preliminary basis for the settlement of the question. Indeed one correspondent has already sent us an algebraical calculation, full of the cube and square root signs, which, if published, would fill a page of our paper, the resulting answer being "two." It is too late for any change in the terms of the question. If we understand the practical effect of L. M.'s reasoning, he makes out that, in a case where a given point can be reached by four routes,—for example, a direct straight road, down a valley, over a hill, or around a hill, the actual length of the path being the same in all, a farmer will gain half the number of revolutions of his wagon wheels by taking the valley road in preference to the straight road; but if he goes over or around the hill, his wheels will make twice as many revolutions as on the straight road.

In Fig. 13 it will be observed that the paths upon which the wheels, F H, roll are of the same length, the wheels start together, roll together, reach the opposite position together, maintain the same relative position throughout their circuit, and complete the movement around the fixed wheel together. It is obvious that both wheels have done exactly the same duty and made the same number of turns upon their own axes. But according to the calculations of L. M. the wheel, F, has turned only once on its axis while the wheel, H, has turned twice. L. M. will need to give further explanation.

MESSRS. EDITORS:—Feeling much interested in the argument going on about the wheels, and yet thinking that you are on the right side of the question, I should like to ask your correspondent, L. M., how he would answer this inquiry: Suppose that he takes off one half of his left wheel

Fig. 14.



leaving the arrow where it is, then roll it up to point, *e*, of his standing wheel, then from there down to the right side of it. Well, according to his idea, the arrow being in the same position on the right as it was on the left, the wheel would have made one full revolution around its axis. But I ask how can it be so, there being only one half of a wheel? It seems to me that it is only half a revolution. P. JEANNE.

Brooklyn, N. Y.

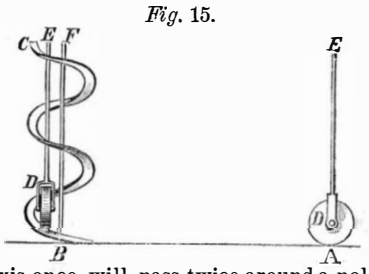
MESSRS. EDITORS:—The movable wheel question still being the subject of discussion with all classes in this vicinity, I would like your decision, with an explanation, that may create satisfaction, which the correspondence you have printed has failed to do. J. B. A.

Riverpoint, R. I.

Ans. Let patience have her perfect work.

MESSRS. EDITORS:—1st. A wheel while turning once on its own axis may make a variety of other movements. 2d. As regards a straight and a circular path, a wheel will make the same number of rotations on its own axis, whether the path on which it rolls be curved or straight, both paths being of the same length. Illustration: A B, straight path; B C, curved path of same length. D, moving wheel, E, vertical shaft rising from the axle of D. Now, one rotation of the wheel, D, will carry A to B, and another rotation will carry the wheel up the spiral path to C. In making this ascent the wheel, D, will turn on its own axis once, will pass twice around a pole, F, and will also impart a perpendicular motion to shaft, E, equal to the rise of the spiral path. The right answer to your question is, *one* revolution on its own axis; the wheel also makes other motions. DUNCAN.

Fig. 15.



Brooklyn, N. Y.

Both of the following letters refer to the same diagram, Fig. 16.

MESSRS. EDITORS:—Having been a reader of your valuable paper for more than fourteen years, and having seldom, if ever, before found its judgment at fault, I must confess that I do think that the answer to L. M., Vol. XVIII., is incorrect. To explain myself I send you a sketch which I hope will enable you to see it in quite a different light. I have a stationary wheel, a movable wheel, and a shaft with universal joints with pointer at top of the frame. Now if I take and revolve the wheel, B, once around A, we will have two revolutions of the pointer. Therefore B has made two revolutions on its own axis. J. G. BAKER.

Philadelphia, Pa.

The pointer makes two revolutions, but not for the reason stated. See answer to next letter.

a one sided view, hastily formed, but from a full understanding and familiarity with the matter in all its bearings. All the diagrams have indicated that the movable wheel is to be considered as rolling around the fixed wheel in the same plane with it, and so it appears to be understood by you and others. One word in regard to what is meant by the term "revolving on its own axis."

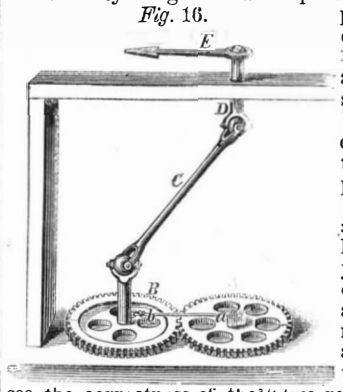
I understand it, in the "scientific" sense, to mean that it revolves around its own center, no matter whether the wheel has a fixed or a loose axis to revolve on.

With this explanation of terms, permit me to re-state the proposition:

"If a movable wheel be rolled around a fixed wheel of equal diameter, in the same plane, it (the movable wheel) will make two revolutions around its own axis every time it rolls once around the fixed wheel."

One of these is caused by the passage around the fixed wheel, the other by the rolling in contact with it. In stating this we do not mean imaginary revolutions, we mean real, positive, *bona fide* revolutions, that can be communicated to a line of shafting or any other machinery, and demonstrated beyond controversy by the stubborn fact. We can scarcely imagine how to prove it any more clearly on paper than some of your correspondents have already done; yet many still appear to doubt it, yourselves among the number. You we can readily excuse, when we remember the arduous duties of a publisher, and how little leisure they can have for abstract questions. We are however very anxious that you should stand correct on all questions; and this anxiety has led us to have made, and sent herewith, a little apparatus that, we think, will enable you to see the correctness of the "two-revolution" position. The apparatus explains itself.

Fig. 16.



To make the position still clearer, I present the annexed diagram, representing the fixed wheel, A, movable wheel, B, with a projecting axle fast to it, and revolving with it; C, bar, with two universal joints or couplings, allowing the revolutions of the wheel, B, to be communicated to the shaft, D, hung in a line with the axis of the fixed wheel. Now, "the proof of the pudding will be found in the eating," and you may stake the public debt of the United States that, for every time the wheel, B, rolls once around the wheel, A, the shafting, D, and pointer, E, will revolve twice.

Wilmington, Del. JOHN G. JACKSON.

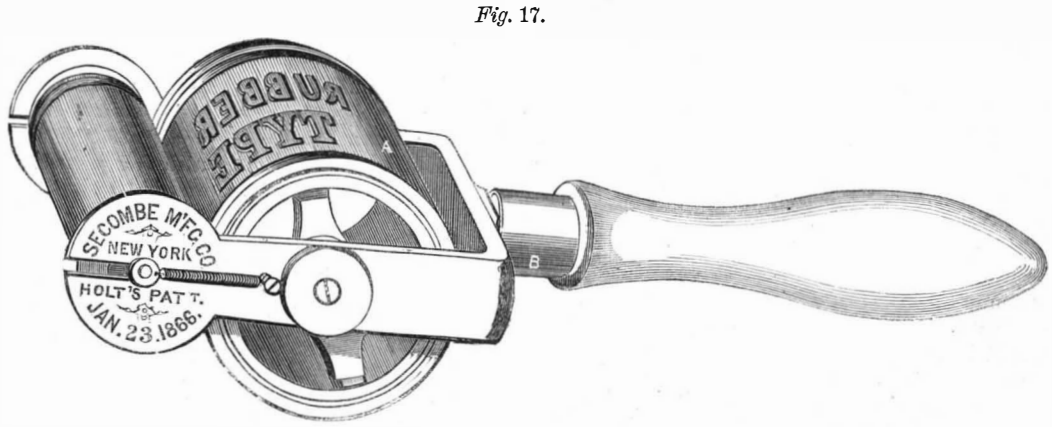
Referring to Fig. 16, we may observe that such a machine will not operate at all, unless an attachment or carrier be supplied to carry the moving wheel and keep it in gear with the fixed wheel. Such a carrier may be readily applied, and we will suppose that it has been done, and that the thing is in working order. The pointer, E, and its shaft, will unquestionably make two revolutions for each rotation of the movable wheel around the fixed wheel. The movable wheel will be conveyed by the carrier once around the axis of the carrier, which is at the center of the fixed wheel. The movable wheel will also turn once upon its own axis, in consequence of contact with the fixed wheel. This single rotation of the movable wheel, B, upon its own axis, may be readily shown by stretching a cord, *b*, from its shaft to *a*, the center of the the fixed wheel. The cord winds once for each rotation of the wheel, B, around A. The compound nature of the movements of wheel, B, is further explained in connection with Fig. 11.

MESSRS. EDITORS:—The movable wheel question being unsettled, or rather, there are those who pretend that a movable wheel will revolve on its own axis twice in going round a fixed wheel of the same size, I submit the following proposition:

I have my office in the establishment of THE SECOMBE MANUFACTURING Co., 264 Broadway (2d floor), who manufacture *Holt's Patent Marking Wheel*, a practical and veritable article used by thousands in this city, a drawing of which I herewith inclose. (See Fig. 17.)

A is a "movable wheel," and whenever it is rolled on any surface, "it revolves on its own axis," and prints, wherever its type surface touches (having an inking roller in front). Now my proposition is this: I will present gratis, to any one of your correspondents, "or any other man," one of the marking wheels, with the party's business card affixed to the wheel (worth $10), who can make this "movable wheel" "turn on its own axis twice," printing twice, in going once round a cylinder of the same size. Any body can try it, by taking the instrument by the handle, and setting up a post, or old ink bottle of the same size. If it prints twice in going round the fixed article, and then those who advocate the one revolution are beaten, the dualists winning, I present the marking wheel to the party demonstrating the fact. But if it will print only once in going round (and it will print every time "it revolves on its own axis"), then the "ones" have gained the day. I will let you know how many make application. C. C. MOORE.

Fig. 17.



264 Broadway, New York, March 5, 1868.

MESSRS. EDITORS:—If the movable wheel revolves on its

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own axis twice, the moon must so revolve monthly, the ball on the church spire and the pebbles on the beach, daily. If you swing a cat around your head, would his head, eyes, and vertebræ each revolve on its own axis, and around each other, severally and collectively? Would he die at the ninth turn? The hero of how many revolutions? H. BLUFFER.

La Salle.

EDITORIAL CORRESPONDENCE.

Sorrento—Amalfi—Pestum—An Excursion to Pozzuoli—Solfatara—Ruins of Temples and Villas—Puetoli of St. Paul —Lake Avernus and the Sibyl's Cave—Virgil's Tomb—The Miracle of St. Januarius

NAPLES, Feb. 12, 1868.

At Sorrento a beautiful spot nineteen miles south-east from Naples, across the bay, we sat within the gardens of the "Tramontano" under the shadow of orange and lemon trees, loaded with their luscious fruits, listening to the songs of birds, and inhaling the fragrance of the flowers and though mid-winter the air was soft and spring-like. Certainly a fitting spot for the abode of Tasso, whose dwelling stands upon the high bluff bordering the sea. The house where we stayed was built by a wealthy English lady, as a winter residence for herself and twenty-four pet dogs. The old tenants have gone the way of all the earth, and now the house is used for a hotel. The grounds enclosing a deserted nunnery with its beautiful gardens and baths, the whole forming a lovely retreat when leisure hangs lightly even upon the hands of a New Yorker, who when at home knows little else than incessant toil and mental activity.

The situation of Sorrento is exceedingly fine. It stands upon a flat semi-circular plateau, sheltered by bold mountain peaks, and fronting the island of Capri, with its blue grotto, the bay and city of Naples, together with views of blazing Vesuvius and the volcanic ranges that run along the coast. This view is indeed wonderful, and especially so upon a clear night, when the whole coast is illuminated by volcanic fires, and the glimmer of thousands of lights. The elder Pliny lived at Stabie, now Castellamaro, near Sorrento, and perished by suffocation at the time of the destruction of Pompeii. Across the woods, over the rocks and mountains, upon another gulf, is what remains of the old city of Amalfi, now reduced to a poor fishing village, but it was the Athens of the Middle Ages, and the seat of a vigorous republic, whose merchants first obtained admittance to Mahometan countries. Upon the rock above Amalfi were found the famous Laws of Justinian, which were captured and carried off by the Pisans, afterward taken by the Florentines, and now kept in the Laurentian Library at Florence, as one of the precious books of the world.

This same old city of Amalfi claims the invention of the compass, and also to have furnished a code of maritime laws that for four centuries were adopted throughout Europe. Still further on is the site of ancient Pestum, whose origin is still a mystery that continues to puzzle the brain of scholars—whether Phenician, Etruscan, Greek, or Sybarite, it is all the same, as there are evidences to support either choice. There are no traces of a city, all vestiges of houses having long since been swept away, but the imposing wrecks of temples and other broken edifices are sufficient to attest its ancient magnificence.

Westward from Naples are the remains of cities and many grand structures of the Romans, who cemented brick and marble together in solid piles, which, though at the time of their construction seemed fitted to stand almost amid the wreck of matter and the crash of worlds, are now but a mere mass of material overhung with ivy and covered by the accumulated dust of centuries.

I cannot conceive of an excursion of one day which combines more real interest and pleasure than to ride out of Naples, passing through the grotto, or tunnel, cut through the tufa rock, 2,500 feet fong and nearly 70 feet high. Above the entrance overlooking the city stands the humble tomb of Virgil, whose verses have converted this whole region into classic ground. The tunuel is brilliantly lighted day and night, and in the center a chapel dedicated to the Virgin has been hewn in the rock, and is never passed by devotees without some sign or expression of devotion.

The tunnel is thronged by pedestrians and vehicles of all shapes and sizes, and clouds of dust, the cracking of whips the rumbling of wheels, and the light of hundreds of gas jets, together with flocks of milch goats which are driven about the streets from house to house—make the place seem like a pandemonium.

A few miles beyond the western end of the grotto is the ancient town of Pozzuoli, now reduced to very low circumstances, but once the chief port of Italy and deeply interesting to every Christian believer, as the spot where St. Paul landed and tarried with the brethren seven days, before setting out for Rome, passing over the Appian way which still continnes to be the principal road between Naples and Rome. The ancient name of the place was Puteoli, and the narrative is given in the 28th chapter of the Acts of the Apostles. At the moment the great Apostle set foot upon the shores of Italy, Puteoli had commodious docks and grand dwellings, now gone to destruction, except a few piles of the pier built by Caligula to carry a wooden bridge several miles across the bay to Baiæ. There are several objects of rare interest in and about Pozzuoli which are worthy of attention. Here are to be seen the remains of the magnificent temple of Jupiter Serapis, with its giant marble columns cut from a single piece, the altar of sacrifice, and the solid foundations now standing ten inches in water, the lower portions being covered with small marine shells, which show that since the building of the temple some change has taken place either in the land or sea, as it is not probable that the builders of the ancient Serapis would have submerged the fine marble pavement of the structure under water. This whole country, however, stands upon a volcano, and it need not surprise any one to hear of the destruction of Naples or any of the other places in its vicinity. I do not wonder that the ancients, dwelling in this region, without the light of Christian revelation, held the supersitious notion that the veritable hell was below them, and the entrance to it not far off.

Just above the town, within easy walking distance, you pass into and across the shell of the crater of Solfatara. It is now private property, and a small fee is exacted from visitors. Think of owning a volcano, and keeping it on hand for exhibition! However, it is now comparatively harmless, and furnishes a large quantity of sulphur, which is an article of extensive export from Naples. At one time, before Vesuvius succeeded to the business, Solfatara was an active volcano, its crater being larger than Vesuvius. At the time of our visit small smoke jets were issuing through fissures in the shell, and a large volume of sulphurous smoke was puffing from the opening of the huge mouth. The guide, by means of a long rake, pulled out masses of hot sulphur. Crude alum and yellow ochre are also found in considerable abundance along the sloping sides of the crater, while a stone thrown upon the crust reveals the existence of a cavern below, which always excites a curiosity to pierce through it, to discover what is going on beneath. Upon the crest of the hill above Pozzuoli are the well-preserved walls of a Roman amphitheater, with its vast subterranean chambers, large enough to seat forty thousand spectators, and next to the Coliseum the most remarkable structure of the kind in Italy.

Still further up the bay are the remains of Baiæ and Cumæ, which in the days of Roman glory were the resorts of the great men of the Empire, who came hither to enjoy the luxury of sea and sulphur baths. Cesar, Cicero, Nero, Hortensius, Severus, Pompey, and other notable men, had their elegant villas perched above the coast, and the ruins of grand old heathen temples to Jupiter, Venus, and Mars, still stand as silent memorials of the great dead. Nero's thermal baths still exist as perfect as when this monster of human pride and wickedness first caused them to be made. They consist of excavations made in the perpendicular face of a large rock, and are reached by a flight of steps. Upon leaving the outer chambers, galleries are run into the mountain, through which issues the steam from a running stream of sulphur water, hot enough to boil an egg. We were invited to enter this infernal region, and following a boy bearing a torch, and divested of all clothing except a pair of brown linen trousers about the color of his skin, we essayed the journey, but found it necessary to crawl along on all-fours, in order to breath the cooler under strata of air. Here we saw the egg boiled, and upon emerging were drenched in a profuse perspiration, and the boy looked as if he had been soused in a tub of water. Few are able to stand the effort, and are glad to beat a hasty retreat before reaching the hot stream. It is recorded that when the profligate Nero visited these burning grottos, "his train consisted of a thousand carriages and two thousand mules shod with silver."

A little way over the mountains is the famous Lake Avernus, and the cave of the Sibyl, through which runs the legendary Styx. The cave is a long excavation cut through the tuf a rock several hundred feet, and to cross the Styx it is necessary to mount pick-a-back upon the shoulders of some rough looking fellows, resembling coal heavers, who are always in attendance to undertake the job for a small fee. We performed this trip, and felt ourselves well repaid for the experiment by its novelty and grotesque character. If the person who attempts the journey happens to weigh a little above the average of our humanity, the guide very politely suggests a trifle more for the extra load. But what adds to the novelty of the trip is to see fashionable ladies cheerfully crawling upon the backs of these guides, and sharing the perils of the voyage across the Styx, to gratify their commendable love for the curious.

The Styx is a dirty pool of warm water, that finds its way into the mountain from Lake Avernus, and becomes tepid, so that long-legged people often get their extremities saturated, unconscious of the fact until they get into day light. The Grotto del Cane is also to be seen, and dogs will be smothered in the noxious gas emitted, if fools enough can be found to pay for the expenses of the sacrifice of a scurvy pup. Another curious feature of this day's excursion is the neatly-rounded, conical-shaped Monte Nuovo, one and a half miles in circumference and 440 feet above the level of the sea. The peak was formed by earthquakes, and eruptions that convulsed this region during three days, in September, 1538. At the same time a portion of the earth sank down, and was covered by water.

The inhabitants of Naples nourish the superstitious belief that they are saved from being overflown by Vesuvius through the intercession of Januarius, patron saint of the city. Upon a stone bridge leading towards the volcano, there is a good marble figure which represents the saint in the attitude of extending his hand in that direction, as if to say, "Thus far and no further mayst thou come." The name and memory of St. Januarius are held in most affectionate esteem by all Neapolitans, and the Cathedral church dedicated to him has a tawdry interior. It is related that the saint was cruelly put to death about the year 300, on which occasion a devoted woman, whose name was lost in the confusion of subsequent events, contrived to sponge up some blood and a bit of straw where the martyrdom took place.

These relics were piously preserved in two vials for several centuries, then it was discovered in some way that the blood, a hard, dry substance, was the subject of a miracle twice a year, and even oftener if occasion required when after suitable prayer and devout ceremonials, liquefaction takes place, the dry clot resuming its original liquid condition. It is said that the people of Naples become very much alarmed, and the lower classes are even dangerous, if for any reason the miracle is suspended. A Paris paper printed the statement that at the time of the French occupation of Naples in 1859 the custodian of the revered relics gave out the opinion that liquefaction would not take place owing to the presence of foreign enemies. The narrative asserts that the French troops were in danger of assassination, whereupon the Commanding General went personally and demanded that the miracle should operate within fifteen minutes or he would shoot the whole of them. The order was obeyed, liquefaction took place, the church bells rang forth the joyful news, and all became tranquil. The miracle transpires in May and September of each year, when all business is suspended, and the proceedings are watched with absorbing interest. Some writers upon this subject have insisted that the belief in the miraculous blood of St. Januarius was perfectly harmless and, moreover, that it operates as a conservative of the public peace.

The people of Naples live out of doors and no other city in Europe presents such a living throng upon its streets and public places. The street corners and by-lanes are filled with stalls, where fruits and lemonade are sold, and small money changers carry on their traffic, women being generally engaged in the business. The people cannot be blamed for staying out of doors, for as a general rule their houses are dingy, dirty looking abodes of wretched misery and discomfort.

The lower classes, generally uneducated, are unable to read and write, therefore the office of professional *Scrivani* still exists in Naples, and they are permitted to occupy tables under an arcade near the royal palace. They write and read letters, and draw up papers for those who cannot do it for themselves. It is a curious sight to see one of these old scriveners with spectacles astride his nose engaged in penning down the secret wishes and prayers of the humble people with a confidence as sacred as that imposed upon the family physician.

Naples and its environs are full of interest, but in the brief space of a letter I am only able to glance at some of the leading attractions, such as present themselves upon every hand, therefore without other details of a ten days' visit, I leave this strange spot and return to Rome. S H. W.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

A gold mine in the deep valley of the Alps, near Salzberg, is the highest in Europe now worked. There are two tunnels near the mines which are entirely surrounded by glacier ice, and the miners of this region undergo great hardships from exposure and avalanches.

It appears from the gold-mining records of the colony of Victoria, that twelve selected mines, with an aggregate paid-up capital of $726,910, have paid as profits in the short period of from seven months to five years, no less a sum than $9,394,585. The history of mining, says the *Mechanics' Magazine*, has never before shown such extraordinary results.

The railways of France, during the past seven years, have killed 297 persons. The companies, in their own defence, assert that of this number, 169 perished through their own imprudence. During the same space of time, 4,515 travelers were seriously injured; 47 by their own fault. In the year 1866, of nearly 250,000,000 passengers, 31 were killed and 540 injured.

Mr. Hewitt, of this city, one of the late Exposition Commissioners, has shown that in the number of days' labor it costs, iron can be produced cheaper in America than in France, Belgium, or England. In Pennsylvania, pig iron can be made at a cost of $24 per tun, representing, at present wages, thirteen days' labor. A tun of bar iron represents the labor of twenty-nine days. In France, a tun of bar iron costs fifty-eight days' labor, and a tun of pig costs twenty-six days' labor, or just twice as much as in this country. The rate of wages and cost of iron per tun, estimated in days' work in Belgium, are midway between the rates in England and France, wages being higher in Great Britain than in Belgium, and higher in Belgium than in France.

The highest average cost per mile for the construction of any of the leading American railways, was $145,630 for the Atlantic and Great Western railroad. The Erie line cost $105,680 per mile. For 4,294 miles of track, belonging to eight of our longest roads, the average cost of construction was $66,747 per mile. The English pay much more for their roads than is the case with us. For 8,611 miles belonging to twelve British lines, the cost averaged $196,225 in gold, but some of the shorter roads cost a far greater sum than this. The North London, eleven miles in length, was constructed for the enormous sum of $1,351,000 in gold per mile.

Notwithstanding the dull times, South Carolina is reconstructing and adding to the number of her cotton mills. We have accounts of new establishments being erected and old ones being enlarged. The total number of spindles now running in the State is 32,000, but the mills running them are all confined to three districts where very little cotton is grown.

It is reported that a silver mine discovered in Prince William, Canada, is capable of producing silver valued at $10,000 a day, and further, that the antimony in it will pay all the expense of working. The metalliferous tract covers a thousand acres, and one happy—or otherwise—mortal owns the whole of it, and believes himself to be the richest man on the continent.

Mr. Delmar, Director of the Bureau of Statistics, furnishes the following compilation of the decennial relation between domestic exports and railway mileage: Decade ending 1837, to one mile of railway, $2,245,000 of exports; decade ending 1847, $32,000 of exports to one mile of railway; decade ending 1857, $16,000 of exports to one mile of railway; decade ending 1867, a little short of $9,000 of exports to one mile of railway.

In St. Louis the total amount of manufactured products for 1867 is valued at $41,625,457. The number of skilled laborers engaged in manufacturing, 9,532; and the value of their services, $7,617,904. The thirty-five flour mills of the city contributed about one seventh of the value mentioned above employed 413 hands, and paid them $387,000 for their labor.

We see it stated that a machine for making pins has recently been completed by a firm in Hartford, Conn., by which between eighty and ninety millions of pins can be made in a day of ten hours, or, to vary the mode of statement, a single machine every minute will supply the world with 144,000 and every second with 2,400 of these small but indispensable conveniences.

According to the Helena *Gazette*, placer mining, the coming season, will be more extensively prosecuted in that section of Montana than ever before Large ditches have been dug, some of which have cost $100,000 each, and the supply of water will be unfailing. It is a reasonable estimate that $1,000,000 were expended last year for operations for this year, and everything predicts a large production of gold and good times generally.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

TRUNK CASTER.—Lewis Horton and Josiah A. McGaw, Manchester, N. H This invention relates to an improvement in the construction and arrangement of casters for trunks and other similar articles, and consists in a corrugated caster roller hung in a frame that is swivelled on a pivot rigidly fastened to a plate that is attached by nails or screws to the bottom of trunk or other article.

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CENTER PLATE FOR CARS.—Geo. W. Bennett, White Haven, Pa.—The object of this invention is to provide a center plate which will prevent the trucks from shearing off of the road m turning a short curve and thereby dispense with safety chains.

CORN HARVESTER.—Elihu Boswell, Highland, Ohio.—This is an improved machine which being driven between the rows of standing corn gathers and cuts the corn on either side and at the proper intervals deposits it between the rows in shocks ready for binding.

CASE FOR WATER WHEELS.—N. F. Burnham, York, Pa.—In this invention curved shutes or water passages of peculiar form are arranged around a circular case and used in connection with a system of gates so constructed and operating with the shutes as to direct the water upon the wheel in such a manner that its whole force is utilized.

RAILROAD SPIKE EXTRACTOR AND JACK.—Joseph Douglass, McConnellstown, Pa.—This invention is a simple, compact and powerful device for extracting spikes from timber, combined with an apparatus which renders the instrument useful for raising ties, rails and other heavy articles from the ground.

FIRE-ARM.—George Holman, Waterville, N. Y.—This invention relates to an improvement in fire-arms of that class which are provided with a revolving many-chambered cylinder. The invention has for its object the combining, in one piece or weapon, of a rifle and smooth bore in such a manner that either may be used at the will of the hunter or sportsman. Also the rotating of the cylinder from the hammer by a means simple and efficient and less liable to get out of repair than the mechanism usually employed for such purpose, and also in a novel arrangement of the cylinder method of securing it in its frame, whereby it is firmly held in position and permitted to rotate under the movement of the hammer with but little friction and consequently without subjecting the actuating parts to any unnecessary or undue wear and tear.

CAR REPLACER.—Charles Hurst, New York city.—This invention relates to a new device for placing cars on tracks and for raising the same over those laying across the track, and is particularly adaptable to horse railroad cars.

FURNACE FOR DECARBONIZING IRON FOR THE PRODUCTION OF STEEL.—Alois Thoma, New York city.—This invention relates to a new process of converting ordinary whiteiron or any other suitable kind of iron into steel of such quality that it may be used for cutting tools and for all purposes for which the best quality of steel is required.

REFLECTOR.—J. A. J. Logan, Moline, Ill.—This invention relates to an improvement in hand lanterns, railroad lights, lamps, etc. and it consists in orming a concave metallic or glass plate on disk with a shoulder and shank attached thereto, whereby it is adapted to the purposes named, and made removable at pleasure.

LIQUID COOLER.—Robert Morton, Stockton-on-Tees, England.—This invention relates to certain improvements in that class of refrigerators in which flattened or other shaped tubs are used for the pnrpose of cooling worts or other liquids or fluids, the liquid to be cooled being passed through the chamber between said tubes in one direction while the cooling liquid passes through the tubes in the opposite direction.

DEVICE FOR CUTTING DRAWERS.—Lyman Bennett, Amsterdam, N. Y.—This invention relates to a method of cutting the fronts and bands of drawers, and it consists in an arrangement of adjustable guides for the cutting knife, and clamp or press bar in connection therewith, for holding the cloth, the whole being arranged upon a table for the purpose assigned.

HEMP DROPPING ATTACHMENT TO REAPERS.—R. C. Wrenn, Waverly, Mo. The object of this invention is to remove the cut hemp as the reaper moves forward, out of the way of the machine and the horses, for the passage of the reaper on the next round, and thus prevent the tangling of the hemp stalks.

STOVE ATTACHMENT.—B. J. Watson, Troy, Wis.—This invention relates to a method of constructing and arranging the flues of parlor and box stoves, whereby a greater radiating surface for heat is presented within a smaller compass.

LAMPS.—S. K. Ayers, Delton, Wis.—This invention relates to an improvement in lamps for burning kerosene and other hydro-carbon oils, which are explosive when the oil becomes heated and vaporizes, and consists in making a vent hole in the base of the burner of a lamp, provided with an adjustable valve to close when the lamp is not in use, for the purpose of preventing the evaporation of the oil.

UPSETTING AND PUNCHING MACHINE.—Samuel E. Lockwood, New York city.—The object of this invention is to forward a machine which shall enable blacksmiths and others to upset wagon tires, or bars of iron or steel, punch holes in the same, or in other plates of metal, and also to gum saws.

BILLIARD CUE CLEANER AND TRIMMER.—Hypolite Pernot, New York city.—This invention relates to a new article of manufacture for cleaning and trimming the ends of billiard cues, and consists in the use of a concave or flat circular, or other shaped plate, made of steel or other hard material, and set in a suitable case, in which a recess or hole is made, to allow the end of the cue to reach the plate. The face of the steel or metal plate is roughened, similar to the face of a file, and thus. by bringing the end of the cue in contact with the face of the plate, the cue may be cleaned and trimmed so as to receive a new clean playing surface.

FASTENING FOR TRAVELING BAGS.—Wm. Wakenshaw, Newark, N. J.—This invention relates to an improved fastening for the sides or ends of traveling bags, and it cousits of a hook-shaped jaw pivoted to each end of the bag, or to the sides of one part of the frame of the bag, and so constructed and arranged that by depressing or shoving down the jaws they will clamp both parts of the frame at each side thereof, and hold the same firmly in contact, or in a closed state.

HEMMER ATTACHMENT FOR SEWING MACHINE.—W. H. Thomas, Galveston, Ind.—This invention relates to a hemmer for sewing machines, and it consists in a novel construction of the same, whereby a hem may be turned or folded underneath the fabric, and without the necessity of previously folding and holding the hem or fabric during the process of stiching, the fabric being folded and retained in a folded state by the hemmer, as the former is drawn through the latter under the feed motion of the sewing machine, and the same is being stitched.

EXTENSION LADDER.—Benj. Pine, New York city.—This invention relates to an extension ladder, designed for general purposes, and consists in having the ladder constructed of two sections or lengths, one of which is fitted in guides attached to the other, so that it may slide freely up or down, and having the sliding section or length connected to one or more endless chains, which are applied to the stationary length; all being arranged in such a maener that by turning a crank the endless chains will be moved, and with them the sliding section or length, and the latter extended or drawn in, as required.

CAR COUPLING.—Silas O. Rogers, Jr., Stanfordville, N. Y.—This invention has for its object to furnish a safe, convenient, and reliable car coupling, which shall be self coupling and at the same time simple in construction and not liable to get out of order.

f POTATO DIGGER.—Wm. H. Chamberlin, Medina, N. Y.—This invention has for its object to furnish an improved potato digger, simple in construction, easily adjusted, and effective in operation.

MOLD FOR ARTIFICIAL TEETH.—A. A. Knowlton, St. Albans, Vt.—This invention has for its object to furnish an improved mold for forming artificial teeth, which shall be simple in construction, effective and convenient in operation, and which will obviate the difficulties heretofore attending the molding of artificial teeth.

AXLES FOR VEHICLES,—J. A. Williams, Elizabeth, Ill.—This invention relates to improvements in axles, and consists in the several devices perfecting the same.

TIRE HEATER.—C. E. Pierce, St. Charles, Ill.—This invention has for its object to improve the construction of tire-heating apparatus, so as to lessen the cost of construction and use, and to increase the convenience of its use and the efficiency of its operation.

GANG PLOW—George Steinegger, Highland, Ill.—This invention consists in the arrangement of certain parts of a gang plow, so as to accomplish more perfectly the work of plowing.

PLOW WHEEL.—E. S. Rice, Paw Paw, Mich.—This invention has for its object to improve the construction of plow wheels, so as to keep the dirt from working in and wearing or clogging the wheel.

APPARATUS FOR CONDENSING AIR.—Halsey Moore, Bangall, N. Y.—This invention has for its object to furnish an improved apparatus for condensing air for use in driving an air engine.

CHURN DASHER.—Robert Crawford, Mercer, Pa.—This invention consists in attaching an air vessel to and underneath the dasher disk of a churn, together with other devices perfecting the whole.

SLED LOCK OR BRAKE.—John Cassidy, Montezuma, Iowa.—This invention refers to the locking of sleds or sleighs when descending hills or declivities. It consists of two angular locking irons, which are raised or lowered by a lever.

NAIL DRAWER AND HAMMER.—Thomas Comstock, Harrodsburgh, Ky.—This invention is a nail-drawing device, having other implements combined in the same tool.

SHEEP RACK.—Jacob Taylor, Beloit, Ohio.—This invention has for its object to furnish an improved sheep rack, cheap, strong, durable, simple and convenient in construction, and which can be used for all the purposes of sheep feeding.

HAY GATHERER AND GLEANER.—John Eliot, Vermillion, Ill.—This invention has or its object to furnish an improved machine, simple in construction, easily operated, and effective in operation, by means of which hay may be gathered and grain fields gleaned quickly and thoroughly.

COMPOSITION FOR CASTS AND FANCY ARTICLES.—Michael Schall, New York city.—This invention consists in forming a composition for making casts for toys and fancy articles.

SPRING BALANCE FOR SAFETY VALVE LEVERS.—James Ayres, Paterson, N. J.—This invention has for its object to furnish an improved spring balance for adjustably and safely securing the safety valve levers of steam boilers, which shall be simple in construction and easily adjusted to hold the valve closed until the pressure has reached any desired point.

BRAKE BLOCK LINING.—Gardner Drake, Farmington, Me.—This invention relates to a new method of constructing the lining of the blocks of car or wagon brakes, and attaching the same to said blocks, whereby the brakes of cars, wagons, etc., are rendered more durable, are less liable to injure the wheels, and whereby the wheels are kept free from snow or mud.

WATER WHEEL.—N. Rose and E. W. Wright, Milford, N. Y.—This invention relates to an improvement in water wheels which rotate or work in a horizontal plane, and which are acted upon both by the direct and reacting power of the water. The invention consists in the employment of adjustable buckets so arranged and applied that water may be discharged from the wheel, in greater or less quantities according to the power required, and the amount of water used be in proportion to the amount of power given out by the wheel.

WATER WHEEL.—M. D. Grow, Fort Dodge, Iowa.—This invention relates to an improved turbine water wheel, and it consists of a wheel having a bell-shaped form or body, and carrying spiral-shaped buckets on the outside of its mouth. surmounted by a guide band which guides the water to the buckets beneath the flume from the shute, set in said flume, in which the wheel is concentrally disposed.

ICE PLANER.—Samuel Lewis, Brooklyn, N. Y.—The object of this improvement is to obviate the many and serious difficulties in the treatment of the surface of ice, which have heretofore been experienced by those having charge of skating ponds, or engaged in the business of cutting ice for the market.

MACHINE FOR BORING POSTS.—B. F. Mohr, Mifflinburg, Pa.—This invention relates to a machine for boring posts, and consists in a frame having an adjustable bar on which is mounted an augur turned by any motor.

PAPER COLLAR AND CRAVAT.—George F. Perkins, New York city.—This invention relates to a combined paper collar and cravat, the cravat being formed on the collar, both being cut from one piece of paper.

ANIMAL TRAP.—John M. Dearborn, Boston, Mass.—This invention has for its object to furnish a simple, cheap, and effective trap for catching rats and other animals.

SLAT MATTING.—William Barton, Troy, N. Y.—This invention consists in connecting a series of parallel slats, with the intervening buttons, by which they are held the required distances apart, by means of ropes or other flexible material.

FURNACE DOOR.—Joseph L. Reilly, Chester, Pa.—This invention relates to a new furnace door for marine boilers, and its object is to facilitate the firing of the furnace, while the vessel labors in a heavy sea. The invention consists in the use of a latch, which is pivoted to the door, and which, when the door is opened, springs into a catch, that is provided on the furnace, so that the door will remain open as long as required.

HAND SPINNING MACHINE.—Anthony W. Silvis, Birmingham, Iowa.—This invention relates to an improvement in the construction of a machine for spinning a number of threads at once by hand power, and consists in a frame on which is mounted a carriage with feed rollers to traverse back and forth to and from a series of spindles arranged across the front end of the frame.

RAILROAD CAR WHEEL.—G. Dock, Wicohisco, Pa.—This invention relates to an improvement in railroad car or truck wheels for mining purposes, and consists in a device in the hub of the wheel for the purpose of preventing the loss of oil from a recess which holds the oil, in order to keep the axle constantly lubricated.

CANE CLEANER.—Samuel Bean, Syracuse, Ohio.—This invention relates to an improved cane cleaner, and consists of a frame clamped to the mill. An iron plate, or stripper, having a hole in its center, is pivoted vertically in the frame. Two crescent-shaped steel plates are constructed in the center of this plate, and two other crescent-shaped steel plates set crosswise up the former, the whole of them held in place by pins and pressed together by springs, and forming a hole through which the cane passes to the mill. A knife is disposed near the top, or in any other convenient position upon the frame on which the cane is passed, to cut off the top before putting it through the hole formed by the crescent-shaped steel plates.

SAFETY ATTACHMENT TO RAILROAD CARS.—George W. Brady, New York city.—This invention relates to a new arrangement for preventing accidents on railroad cars, and consists in the use of a shield arranged around the wheels in such a manner that by the same any obstruction on the track will be pushed off, so that the wheels of the car cannot pass over and injure persons that may be laying or falling upon the track.

SNOW CLEANER.—Samuel Lewis, Brooklyn, N. Y.—This invention relates to a device to be used for the removal of snow and cut ice from the surface of ice lakes and skating ponds. The invention consists in a peculiar construction of the machine, whereby the snow or cut ice, as the machine is drawn along, is scraped up, and by a very simple manipulation on the part of the device, deposited in piles on the banks or sides of the lake or pond.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

F. R., of N. Y.—"Will you give me some information in regard to the manufacture of white gunpowder and where it can be obtained?" It is made of chlorate of potash, ferro-cyanide of potassium—commonly known as prussiate of potash—and sugar. The proportions we cannot state. It is used generally for firing cannon by friction, its chief danger being the readiness by which it may be exploded by friction

E. R., of Mich., asks if there would be "any difference in the pressure of steam on two slide valves of a steam engine, one with ports under it and the other without." If the valves fitted their seats and the atmosphere reached the under side of the ported valve there would be on that the atmospheric pressure of fifteen pounds to the square inch to offset the steam pressure on that valve, and not on the other; but we never heard of a steam engine valve without a port under it.

C. A. W., of Pa.—"What shall I cover my boiler with to confine the heat so as not to be uncomfortable to the men at work close by it?" If your boiler is not incased in masonry we recommend hair felting covered with wooden lagging.

J. M. K., of Conn.—"Will lead sink in water ten miles deep?" We have never been so low. Go down and see for yourself.

J. F. G. of Ohio.—"How is canvas prepared for painting on?" The canvas is stretched, sized with glue, and then coated with white lead, which when dry is rubbed down with pumice stone, when another coat of paint is applied and the canvas is ready for colors.

T. D. R, of Canada.—"What is the use and botanical source of spruce gum?" As its name denotes it is an exudation of the spruce tree, and it is used by school girls and boys as a juvenile substitute for tobacco. See an article on the subject in a previous issue of this paper.

S. N. T., of Md., desires a composition to resist the acids in an electro-plating bath to preserve those portions on which no deposit is required. Perhaps the engraver's etching ground will answer the purpose. It may be made of 2 oz. white wax, ½ oz. burgundy pitch, ½ oz black pitch and 2 oz. asphaltum, all but the asphaltum melted over a fire the latter ingredient added in the form of a fine powder, gradually Spirits of turpentine is the solvent to reduce the composition to the requisite consistency.

C. S. S., of Ill.—There is no way known to us to clean a kerosene oil barrel so as to fit it for other uses, as for pickling pork, etc. The penetrating quality of kerosene baffles any ordinary means of removal.

A. F. T., of Wis.—"How can paper be prepared to make pencil marks indelible?" We wish we knew.

J. P. A., of Ohio.—Your friend who has the "self mover" has got either a fortune or an elephant; probably the latter. When perpetual motion seizes a man quinine will not help his case.

J. E. B. N., of Ala., has found a place, by means of a letter, where $9,000 of specie and plate was buried during the war, but as the locality cannot be exactly determined within fifty yards, he desires the interposition of the "divining rod." The best implements for the case are pick, shovel, and muscle.

T. F. W., of N. Y.—"Why will common salt liquefy iron when it clogs in coming from the blast furnace?" We suppose for the simple reason that it, like some other salts, is a flux.

J. E. S., of Ark.—There is no difficulty in running a rubber belt in water. The rubber is water proof, is it not?

C. E. P., of Vt.—Ornamental brass work is cleaned by almost any acid; even vinegar will do it. Its brightness is preserved by any simple transparent varnish.

S. C. T., of N. J.—"Are kerosene lamp explosions caused by inflammable gas or does the liquid itself reach it, and in either case will the explosion occur by heat alone?" The mixture of the vapor of oil and atmospheric air is explosive; not the liquid oil. We doubt the explosion of this vapor without contact with fire.

E. A. B., of Mass.—"What are the benefits of using salt in kerosene lamps?" Salt has probably no effect. If it could be dissolved in the oil it would give a ghastly, yellowish tint to the light. We doubt its utility.

F. S. B., of Mass.—"What proportion of water should be used in mixing plaster of paris so that no shrinkage results in setting?" The material of commerce is so varying in its quality that only actual trial can determine.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

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Two Valuable Patents for sale—one for a Fertilizer, and the other for Harness Wardrobe. Address H. E. Pond, Franklin, Mass.

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Patent Office Reports.—Persons desiring Patent Office Reports can be supplied at low prices. Address S. C. Jones, Box 773, N. Y

Makers of Machines for getting out hhd. and pipe Staves, will send circulars to Butts & Brother, Georgia Land Agency, Macon, Ga.

Water-proof Paper—Manufacturers of—please send address or circulars to Hoeckley & Hall, 448 York avenue, Philadelphia, Pa.

Wholesale and Retail Agents wanted for Hyslops & Phillips' Patent Combination Stove Lifter and Dish Tongs. 100 per cent profit. T R. Bearse, Taunton, Mass.

Patentees of brick machines send circular to W. D. Wesson, Springfield, Mo.

Wood-shaving Boxes—Manufacturers of—please address or send circulars to Hoeckley & Hall 448 York avenue, Philadelphia, Pa.

Patentees or others wishing to have light articles made from steel or wrought iron, address S. H. Jennings, Deep River, Conn.

A Fortune may be realized by purchasing the right, and Manufacturing the Book Clamp of Miller & Watson, advertised on the last page of this paper. The patent was taken by Munn & Co., and the article has been examined and approved by the editors of this paper. A descriptive circular will be sent on application to the advertisers. See last page.

Winans' Anti-incrustation Powder, (11 Wall st., N. Y.,) reliable and uninjurious in preventing scale in Boilers. 12 years in use.

Manufacturers of Steel Castings please address Cumming Bros., Oil City, Pa.

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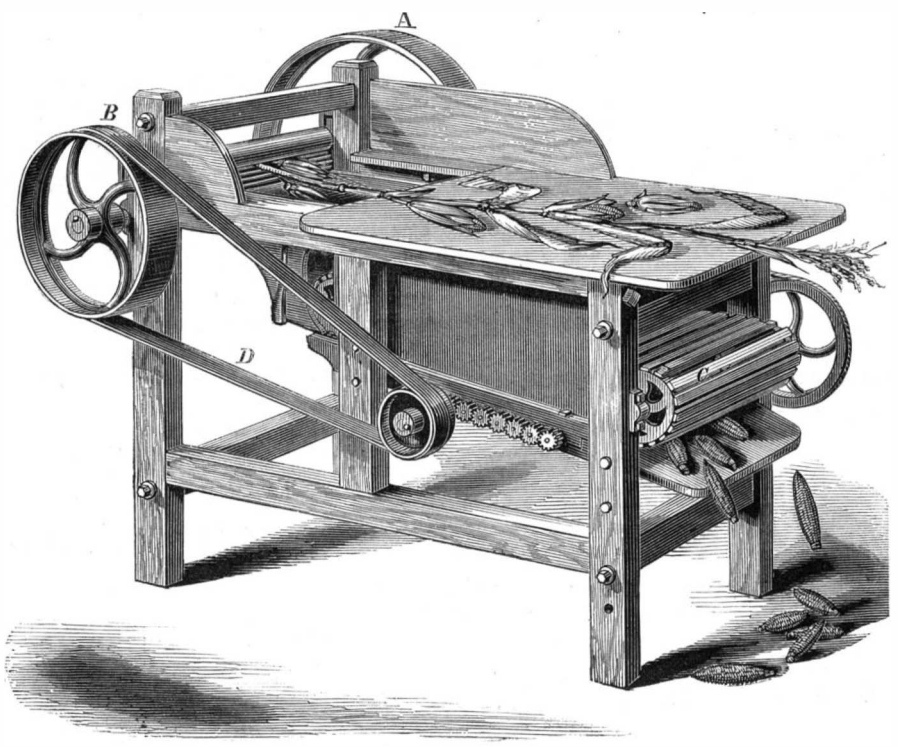
Improvement in Machinery for Husking Corn.

Machinery for husking corn has been attempted for years, but the various devices prove to have been more or less imperfect. Some of them only partially husk the ear, some partially shell the corn from the cob, and others waste the husk, now become a valuable commodity, not only for filling beds, mattresses, and cushions, but for manufacturing into paper, cloth, and other fibrous substances.

The machine shown in the engraving is intended to obviate these difficulties It may be run by hand or power, the hand machine having a capacity of twenty-five bushels per hour, and the power machine of from forty to sixty bushels. The machine is simple in construction and requires but little power to drive it. Power is applied to the wheel, A, on the axis of a fluted iron roller, called the picker, which carries, on the other end of its axis, a pulley, B. Over the picker is a smooth wood en roller, the object of the two being to pick the ears from the stalk. From the picker they fall into a hopper, which has communicated to it a rapid vibratory motion, which, together with its inclined bottom, compels the ears, in their passage, to present themselves to the next operation sidewise, and not endwise. The ears are now carried forward to the husking rollers by means of an endless apron, C, made of wooden slats. The next operation, which is the husking proper, is performed by means of a series of rollers driven by the belt, D, and connected by gears. The boxes for the journals of these rollers, lying in a groove, are divided by elastic cushions which allow for the passage of husks of varying thickness, or pieces of stalk, or other substance that may accidentally be drawn in. The apron, during the process of husking, which is but momentary, rotates the ears on the husking rollers. By this means the husks are cleanly stripped off and the ears carried away by the apron and delivered, as seen in the engraving. The stalks are fed to the picker from the table or top of the machine. The picking device, like the husking rollers, has yielding bearings of rubber or other elastic material, which allow stalks of varying sizes to pass, but compel the ear to drop into the vibrating hopper. The stalks are delivered lengthwise in front of the machine ready for bundling—the bright, clean husks by themselves underneath it, and the husked ears in the rear, as shown. Patented July 2d, 1867.



THE NATIONAL CORN-HUSKING MACHINE.

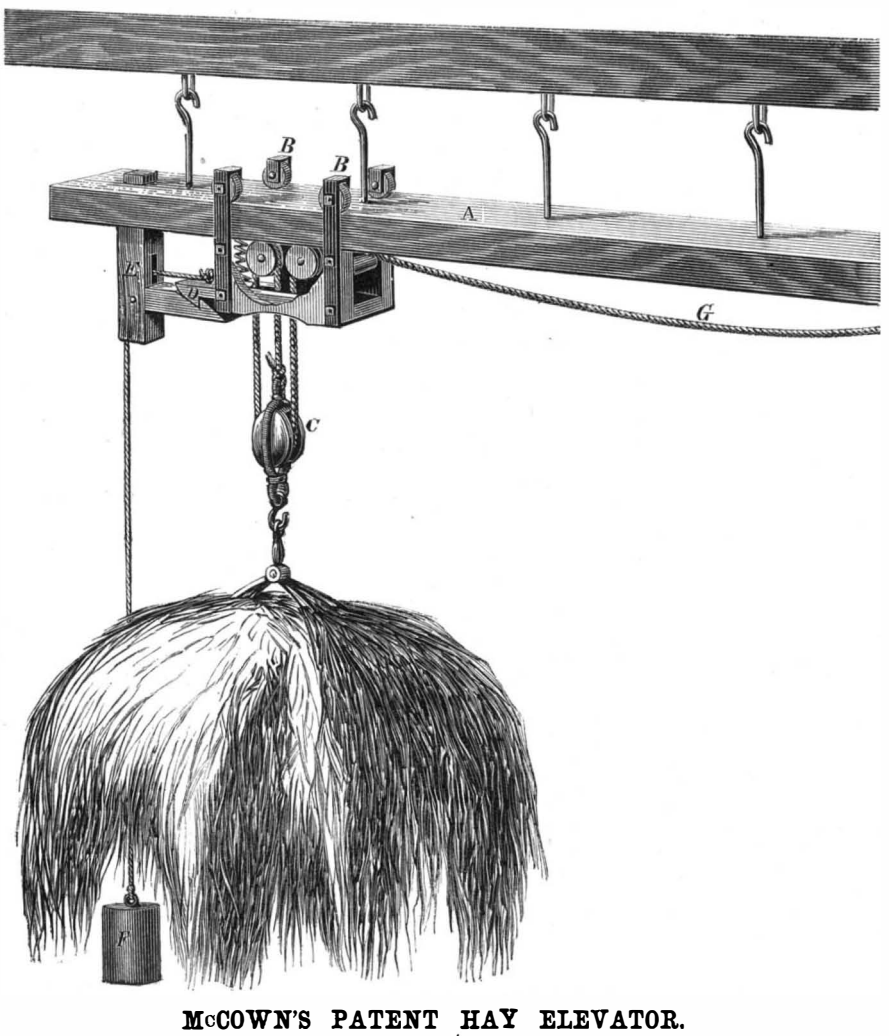
All communications should be addressed to the National Corn Husker Co., 164 Duane st., New York city.

Improved Device for Elevating and Depositing Hay.

The intention of the invention herewith illustrated is to furnish a handy and effective device for elevating hay from the wagon and depositing it upon the bay, mow, or stack, at any point desired.

A represents the way, suspended to the rafters or string pieces of the barn, and supporting a carriage which traverses the way by means of straps and rollers, B. Within the carriage are two grooved rollers, or sheaves, over which and the sheave of the pendant block, C, a hoisting rope is rove, as in the ordinary fall or tackle. The block is provided with a hook to receive the eye of a hay fork. The bottom of the carriage is a pivoted latch, D, to which is attached a line passing over a pulley in the projection, E, and sustaining a weight, F, which has a tendency to draw the carriage toward the bar, E, so that the notch in the bottom, D, will engage with a corresponding one in the horizontal arm of E, and the fork and carriage be held in position while the former is being elevated; otherwise, the pull of the draft rope, G, would move the carriage on the way while the hay was being raised. As, however, the fork reaches its highest point, the block, C, elevates the latch, D, freeing the carriage, when it runs along the way until it arrives at the spot desired, when the fork is tripped, the load discharged, and the horse backed, permitting the weight, F, to return the carriage to place. The process is indefinitely repeated until the hay is all deposited.

Letters patent were secured through the Scientific American Patent Agency, January 7, 1868, by Harvey and Luther M. McCown, either of whom may be addressed for information regarding the sale of rights, etc., at Enon Valley, Lawrence county, Pa.



McCOWN'S PATENT HAY ELEVATOR.

The Coloring of Brass.

Although no alloy presents a more agreeable appearance to the eye than brass when it is in a high state of polish, yet the facility with which it tarnishes has rendered it necessary to color or bronze it, especially in those instances where its use exposes it to the liability of being frequently handled. Many of our readers no doubt remember the time when all scientific instruments, such as theodolites, levels, sextants, and numerous others of a smaller character used in the drawing office, were all manufactured *bright*, as it is termed. At present the best makers universally bronze instruments of the former class, and though they have not absolutely renounced the manufacture in brass of those belonging to the latter, yet they invariably recommend, and justly, those made of white metal. The reason that it was not until comparatively recently that brass was colored or lackered, is probably because it takes a layer of color very badly, and without certain precautions when a coating is laid on, the least shock will suffice to cause it to scale off. Some interesting details have lately been published respecting this very practical subject in a German cotemporary, illustrating the methods employed in obtaining a color of any required tint.

An orange tint, inclining to gold, is produced by first polishing the brass and then plunging it for a few seconds into a neutral solution of crystalized acetate of copper, care being taken that the solution is completely destitute of all free acid and possesses a warm temperature. Dipped into a bath of copper, the resulting tint is a grayish green, while a beautiful violet is obtained by immersing it for a single instant in a solution of chloride of antimony and rubbing it with a stick covered with cotton. The temperature of the brass at the time the operation is in progress had a great influence upon the beauty and delicacy of the tint; in the last instance it should be heated to a degree so as just to be tolerable to the touch. A moire appearance vastly superior to that usually seen is produced by boiling the object in a solution of sulphate of copper. According to the proportions observed between the zinc and the copper in the composition of the alloy, so will the tints obtained vary. In many instances it requires the employment of a slight degree of friction, with a resinous or waxy varnish, to bring out the wavy appearance characteristic of moire, which is also singularly enhanced by dropping a few iron rails into the bath. There are two methods of procuring a black lacker upon the surface of brass. The one, which is that usually employed for optical and scientific instruments, consists in first polishing the object with tripoli, then washing it with a mixture composed of one part of nitrate of tin and two parts of chloride of gold, and after allowing this wash to remain for nearly a quarter of an hour, wiping it off with a linen cloth. An excess of acid increases the intensity of the tint. In the other method, copper turnings are dissolved in nitric acid until the acid is saturated; the objects are immersed in the solution cleaned, and subsequently heated moderately over a charcoal fire. This process must be repeated in the order to produce a black color, as the first trial only gives a deep green, and the finishing touch is to polish with olive oil. Much pains is taken abroad to give brass objects "an English look." For which purpose they are first heated to redness, and then dipped in a weak solution of sulphuric acid. Afterward they are immersed in dilute nitric acid, thoroughly washed in water, and dried in saw dust. To effect a uniformity in the color, they are plunged into a bath consisting of two parts of nitric acid and one part of rain water, where they are suffered to remain for several minutes. Should the color not be free from spots and patches, the operations must be repeated until the desired effect is produced.—*The Engineer.*

Cause of Lamp Explosions.

The Boston *Journal of Chemistry*, in an article on the chemistry of kerosene, speaks as follows. As an explanation of the causes of lamp explosions, it is worth studying, that these accidents may be avoided:

As has been stated, kerosene is not explosive. A lighted taper may be thrust int it, or flame applied in any way, and it does not explode. On the contrary it extinguishes flame, if experimented with at the usual temperatures of our rooms. Kerosene accidents occur from two causes: First, imperfect manufacture of the article; second, adulterations. An imperfectly manufactured oil is that which results when the distillation has been carried on at too low temperature, and a portion of the naphtha remains in it. Adulterations are largely made by unprincipled dealers, who add 20 to 30 per cent of naphtha after it leaves the manufacturer's hands. The light naphthas which have been spoken of, as known in commerce under the names of benzine, benzoline, gasoline, etc., are very volatile, inflammable, and dangerous. They, however, in themselves, are not explosive; neither are they capable of furnishing any *gas*, when placed in lamps, which is explosive. Accidents of this nature are due entirely to the facility with which *vapor* is produced from them at low temperatures. But, the vapor by itself is not explosive; to render it so, *it must be mixed with air*. A lamp may be filled with bad kerosene, or with the vapor even, and in no possible way can it detonate, or explode, unless atmospheric air has somehow got mixed with vapor. A lamp, therefore, full, or nearly full, of the liquid, is safe; and also one full of pure warm vapor is safe. Explosions generally occur when the lamp is first lighted, without being filled, and late in the evening, when the fluid is nearly exhausted. The reason of this will readily be seen. In using imperfect or adulterated kerosene, the space above the line of oil is always filled with vapor; and so long as it is warm, and rising freely, no air can reach it, and it is safe. At bed-time when the family retire, the light is extinguished; the lamp cools, a portion of the vapor is condensed; this creates a partial vacuum in the space, which is instantly filled with air. The mixture is now more or less explosive; and when, upon the next evening, the lamp is lighted without replenishing with oil, as is often done, an explosion is liable to take place. Late in the evening, when the oil is nearly consumed, and the space above filled with vapor, the lamp cannot explode so long as it remains at rest upon the table. But take it in hand, agitate it, carry it into a cool room, the vapor is cooled, air passes in, and the vapor becomes explosive. A case of lamp explosion came to the writer's knowledge a few years since, which was occasioned by taking a lamp from the table to answer a ring of the door-bell. The cool outside air which impinged upon the lamp in the hands of the lady, rapidly condensed the vapor, air passed in, explosion occurred, which resulted fatally. If the lamp had been full of fluid, this accident could not have occurred. Before carrying it to the door, flame might have been thrust into the lamp with safety; the vapor would have ignited, but no explosion would have taken place.

IN investigating the electricity of steam, Faraday found that dry steam gave no excitement, and that the electricity resulted from the friction of the vesicles of water against the sides of the orifice.

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PRACTICAL INFORMATION FOR MECHANICS.

The lecturer on chemistry would find his desk and text books alone very insufficient appliances for conveying the information designed. He must have his laboratory, or such portion of it as he requires, to illustrate that branch of his subject upon which he desires to speak. And his text must be made plain and palpable by means of experiments, conducted before his audience. It is so in medical lectures, and in other branches of human knowledge; and being so, why cannot the benefits of a union of theory with practice be extended to that highest and most valuable branch of arts—mechanics.

It is a notable fact, that lectures generally, which profess to give theoretical information to practical mechanics, and those desirous of learning the business, are so abstruse, perhaps pedantic, and so entirely theoretical, that the hearer goes away with the idea of a load, which is merely a load, not valuable or available. Perhaps some of this is due to the fact that many of these self-called teachers have no practical knowledge of any branch of mechanics, and therefore cannot be expected to afford the information which they do not possess. But another difficulty is, that their teachings, instead of being addressed to those who need them most, are intended for persons who have, at least, mastered the rudiments of their business, and generally to those who have advanced (or retrograded) from the mere art or practice of mechanics to its theoretical formulæ.

There would seem to be no adequate reason why our young mechanics, and others whose proclivities are toward that valuable branch of useful knowledge, should be debarred from the privileges accorded to chemical and surgical students, and we believe that one or more courses of lectures annually, on mechanics, illustrated by practical experiments, in New York city, would be not only well patronized, but also of great benefit. Of course, it could not be expected that a complete foundery, forge, machine shop, sash and blind establishment, and sawing and planing mill could be run occasionally, merely to illustrate mechanical lectures; but such machinery and appliances as are calculated to exhibit the proper method of working materials employed in the arts could be readily and cheaply obtained and put in operation. It is not enough to say that the knowledge thus designed to be imparted should be sought only in the shop. To this, hundreds who would like to learn the business, are debarred access, and also many who would like to understand the *modus operandi* of mechanical operations without spending years in actual practice of the work.

A small forge, two or three diminutive lathes, for drilling, turning, and screw cutting, a planer for iron, and one for wood, with a circular saw, etc, would serve to illustrate the different qualities of different metals, and of different woods, with the peculiar appliances and tools necessary to meet these varying qualities. And this is the sort of knowledge our young men need; they want to see the process which they have heard described. They wish to understand the reason why brass cannot be worked in the same way and by the same tools as iron. It is not enough to tell them that brass is softer than iron, etc. They also wish to know why a tool which cuts lignumvitæ, one of the hardest woods known, will not cut white pine, one of the softest. And a hundred-and-one other wants of knowledge will remain unsupplied until theoretical and practical information for mechanics is combined.

We believe that here is a field opened for culture which has long laid untilled. We believe that a taste for a practice of the mechanical arts can be in no way so readily cultivated and the advancement of the useful branches of science, as practically applied, so easily and rapidly secured.

We commend these suggestions to the consideration of such public spirited and large minded men as Peter Cooper, and others of his "ilk," in other cities. Let the experiment be tried and it will be found that hundreds now prevented from securing a useful education will avail themselves of such means as we have here suggested.

IMPROVEMENT IN THE MANUFACTURE OF MACHINISTS' TOOLS.

We believe this was the first journal, at least in this country, that advocated the manufacture of machinists' hand tools as a specialty. When we were serving our novitiate at the machinist's business, and long after, it was compulsory that every workman should make his own inside and outside callipers, straight edges, squares, rules, hammers etc; and to finish his drills, turning tools, planing chisels, and many other appliances used in his work. He must also contrive temporary chucks for boring and turning, and make his drill holders or chucks. Many of these tools were considered by their makers their masterpieces, and were often marvels of skilled and patient labor. In accuracy, facility of handling, and beauty, many of them compare favorably with the machine made, standard articles. The machinist who could show a kit of highly finished tools, made by his own hands, had reason to be somewhat proud, and frequently the exhibition of these products of his skill secured him the confidence of his employer and the respect of his fellows. Even to this day we confess to the weakness of admiring the machinist who possesses these evidences of his interest in his business. It is an admirable trait in the character of the mechanic that he loves to possess and to use good, and even elegant tools. The sloven who cares nothing about the appearance of his tools so they serve his purpose never so clumsily, not seldom is satisfied with turning out an imperfect job so long as it will "go." This slovenliness and carelessness bring discredit on mechanics and induce a want of confidence in their work.

Still, we would not advise the waste of time and expenditure of labor by the workman on the manufacture of his own tools, when for a fraction of the value of that time and labor he can purchase accurate and handy instruments which can be relied on. To this, however, we make one exception. Never yet have we seen a sale hand hammer that suited the hand either in shape, balance, or "hang." Probably no tool used by machinists is subjected to a greater number of whims, some of which may be merely fanciful, but many of which are based on common sense. Working with a strange hammer, the mechanic almost invariably will make foul blows and produce imperfect work.

But the twist drills, machine made, which have worked their way into favor against prejudice and factious opposition are proof of the advantages of standard tools. We have now gages, rules, circular, iron-cutting saws, squares, turning tools, etc., which for handiness, excellence of material, and accuracy are unsurpassed. They are made by machinery which is infallible in its operation, and by manufacturers who make them a specialty and base their reputation upon their perfection. These tools have been as great an aid to the progress made in machine building as any other one agency. But they have an advantage beyond this. They produce uniformity of work, uniformity of measurements, uniformity of construction throughout the country, rendering repairs more easy and replacement of parts less difficult. It is an evidence of advancement that our mechanics appreciate these decided improvements. There is no shop of any note in the country but has the standard tools, the manufacturer's stamp on which is ample guarantee of their reliability and accuracy.

FISH AS FOOD---ITS RELATIVE VALUE.

The subject of the cultivation of fish—the re-stocking of ponds and streams with varieties which have become scarce and nearly extinct, and the value of fish for food—has been elaborately treated and generally discussed in the journals of the day. It is a subject of very great importance, and those public spirited men who have engaged in the work of reproducing valuable varieties of fish deserve much credit for their endeavors.

Still, we think one argument upon which they seem greatly to rely is scarcely so strong and convincing as the importance they attach to it would imply. That is the cheapness of fish as compared with flesh. It is certain that some varieties of fish, in their season, are plentiful enough in the market to make them cheap; but it is equally certain that, compared with mutton, beef, and pork, they are anything but cheap. Despite the statistical tables of out economic wiseacres, who spend their time in calculating the amount of nutritious substance contained in a certain quantity of certain food, and how cheaply soul and body may be kept together, we have yet to see the proof that fish at the prices now asked for it, or at the imaginary prices which it is believed will follow its more plentiful supply, will ever usurp, to any great extent, the position which flesh meats occupy.

No peoples have a very strong *penchant* for fish as a "steady drink," and at the best it is regarded as a makeshift or temporary substitute for a kind of food for which the stomach craves and which, perhaps, the pocket cannot supply. Nobody who has tried it believes that two pounds of fish at twelve cents per pound are equal in life-giving qualities to one pound of beef at twenty-four cents per pound. A soup made, even from the bones of beef, mutton, pork, or fowls is more "staying" than any clam, oyster, or fish soup that can be concocted, saving the admixture in the latter of vegetables, bread, pork, etc. Fresh salmon costs twice as much as beef steak, not alone because it is scarce and difficult to obtain, but because it is nearly equal if not quite in its satisfying quality to beef. That scarcity of the fish has nothing to do with its market price is fully proved by the fact that, salted and smoked, it is as cheap as ordinary beef.

The true value of the movement of pisciculture, now so popular, consists simply in this: Keeping the price of fresh fish, as a variety of diet, within such bounds as will enable those whose means are circumscribed to make an occasional divergence from their daily *menu*. That it can ever supersede flesh for food is a vagary which, as relates to the people of this country, might as well be dismissed first as last.

THE NEW FRENCH GAS LIGHT.

Our foreign exchanges several weeks since, announced an improvement in gas lighting which had been discovered by two French chemists and was about being introduced into Paris. Great advantages on the score of brilliancy of illumination, and especially, on that of economy, were claimed for the new invention which, it was predicted, would soon complete an entire revolution in our present system of gas lighting. Beyond however, brief and unsatisfactory descriptions, which indicated that the apparatus embraced some modifications of the Drummond light but failed to show the distinguishing peculiarity, the first intelligible account we have met with, is just at hand.

The ignition of the gas formed by the union of oxygen and hydrogen or ordinary illuminating gas, is the principal secret of the process, and any novelty the apparatus may possess is the manner in which oxygen is cheaply procured from the manganate of soda. A reverberatory furnace heats seven retorts having each a capacity for 231 pounds of this substance. Superheated steam, having a temperature of 842° Fah., is admitted into these retorts from a connecting steam boiler. Thus brought in contact with the steam, the maganate of soda becomes decomposed and its oxygen being freed, is swept off by the steam into a condenser. This latter vessel is filled with wet coke which condenses the watery vapors, and permits the oxygen to pass to the gas holder, ready for use. Remaining in the retort are left the manganese and soda; these are recombined as the manganese takes up fresh oxygen from a current of cold air which is forced into the retort by a powerful blower driven by a steam engine. The same process being renewed indefinitely, a steady supply of oxygen may be obtained. By means of separate pipes, oxygen, and hydrogen from the ordinary gas mains, are led to the burner, when they are lighted and the flame being directed against a piece of magnesia, an intense light results.

Our authority states that the French Emperor, wishing to satisfy himself personally of the truth of the facts regarding this new light stated by the Parisian journals, summoned the inventors to the Tuilleries, and during two evenings the apartments of the Imperial Palace were brilliantly lighted by their apparatus.

In regard to the cost of this oxy-hydrogen light, the French papers assert that the oxygen can be made for less than forty cents per thousand cubic feet, and that three cubic meters —106 cubic feet—of coal gas, and four cubic meters—141 cubic feet—of oxygen, costing about $1,69, according to photometric tests, give as much light as 180 cubic meters—6,357 cubic feet—of coal gas having a value of about eleven dollars, or, as they claim, for equal quantities of light a saving is made of $8,60, and allowing for the necessary imperfections of newly devised apparatus, the securing of three or even four times the economic advantage at less than one half the outlay, is believed to be possible.

In commenting upon this French project, the *Mechanics' Magazine* takes a somewhat different view regarding the economical value of the new improvement, and believes that the bright anticipations of the Parisian Company will never be realized.

"The projectors of the scheme intend employing the oxygen in the proportion of about a fourth of the coal gas, so as to increase the intensity of the illuminating power nearly eight times. First, can this result be accomplished? Secondly, if it can, will it be more economical than the present system? Taking the relative values of coal gas and pure oxygen as 1 to 7, it is evident that in order that the price should remain the same, the quantity of gas consumed by the proposed plan should only be one-seventh of that burned at present. But the quantity of light developed by a burner is proportional to the area of the flame for a given intensity. If oxygen be the illuminating agent, the intensity will be greater than that of the same quantity of coal gas consumed in a given time; but since the combustion of the former will be more energetic, the area of the flame will undergo a corresponding diminution, which may be estimated at one fourth. As the quantity of gas is reduced to a seventh, the actual flame is, therefore, represented by a twenty-eighth and, consequently, instead of an illuminating power of seven times the intensity of coal gas, one of twenty-eight times is required to maintain an identity in the cost. Unless the manufacture of pure oxygen can be reduced to a price less than 1s. per cube yard, which is certainly assuming a condition of affairs for which there is no warrant, it is scarcely possible that the new project will be found to succeed.

"Conceding that both in quantity and quality the oxygen can be produced and stored in suitable reservoirs, the next step is to convey it to its destination, and this involves a task of no ordinary magnitude. Owing to the tremendous explosive powers of the two gases when mixed, and ignited without due precaution, the oxygen and the coal gas could not be conveyed in the same pipes. The former must, therefore, have a special service of its own, and also one in every respect superior to that given to its neighbor. Coal gas is so readily manufactured, that, comparatively, its value is not very high, and companies are quite satisfied to regard with indifference

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the enormous loss that occurs through leakage and bad manipulation of the pipes. It has been alleged that so much as 50 per cent of all the gas made in London is lost in one way or another. When, however, it becomes a question of transporting a substance which under the same volume possesses a much higher value than coal gas, the service pipes must be laid in a better manner, and the whole system attended to with a commensurate degree of vigilance and precaution. In addition to entailing a new set of pipes, all the present burners would be useless under the proposed system, and it would be necessary to replace them with others adapted for the employment of a solid instead of a hollow flame.

"With respect to a city similar to Paris, there are many additional disadvantages which a company of this description has to contend against which are unknown to ourselves. Our streets are common property, and any one who owns a few yards of piping may prove his title to "a right of way" by ripping up the road, obstructing the traffic, and causing a local nuisance for almost any length of time. There is not a single main thoroughfare in London that is not disembowelled at least once every three months. Matters are otherwise managed on the other side of the Channel, and in connection with our subject it may be remarked that the ground is already occupied by an existing company whose interests would be carefully protected. There is another feature presenting itself worthy of consideration. The City of Paris levies a duty upon every cube yard of gas consumed. If, therefore, the employment of pure oxygen will reduce the annual consumption of that article to one seventh of the original quantity, there is no question but that in order to preserve the total amount of the rate unaltered, seven times the duty will be levied off the oxygen which has caused the decrease."

Editorial Summary.

POROSITY OF IRON.—The porosity of cast iron is a well-known fact. Many years ago, Mr. Perkins forced water through thick plates of it; hence it is not astonishing that gases pass with ease. A few years ago, a physician at Chambery was struck with the circumstance that an epidemic of fever occurred in Savoy every winter; and he fancied that he had traced the cause to the use in the cottages of cast-iron stoves, which allowed the gases of combustion to pass into the atmosphere of the rooms. The subject has been investigated by MM. Deville and Troost, and they find, by a very carefully conducted experiment, that hydrogen, carbonic acid, and carbonic oxide, do actually pass through the walls of a cast-iron stove, at a dull as well as a bright red heat. The fact is worth knowing here, for such stoves are often used in this country, and most frequently in ill-ventilated apartments. The amount of gases which pass is certainly not large, but carbonic oxide is an exceedingly poisonous agent, and most of the discomfort experienced in rooms heated by these stoves is no doubt attributable to that gas. The subject deserves the attention of manufacturers, who might possibly devise a tile or clay-lined stove that would diminish the inconvenience we mention, and at the same economize fuel.

ELECTRIC LIGHT.—In Holmes's magneto-electric machine each revolution developes sixteen currents in opposite directions; hence the light it produces must be discontinuous, being extinguished and relighted sixteen times in the course of each revolution. As the machine makes 500 revolutions in a minute, the interval of time during which the current is cut off is excessively small; nevertheless, M. Jamin thought he could demonstrate the intermittence of the light. He failed to do this, but was able to recognize that the light of the luminous arc was less intense than that given off by the charcoal points, which he attributes to the interruption of the current. Properly speaking, he says we have in this lamp not the discontinuous electric light, but that of the carbon poles heated to intense whiteness, and giving a light nearly uniform. The light of the magneto-electric machine is, therefore, less blue and poorer in chemical rays than that from a lamp excited by a battery, and consequently better adapted for lighthouses.

AMERICAN INVENTION AHEAD.—The Director General of French Telegraphs, desiring further improvements in the telegraphic material in use in that country, some time ago appointed a commission specially charged with the selection of the best kind of insulator for adaptation to the French telegraphs. Having completed their examination we learn that choice has been made of an insulator invented by Mr. David Brooks, of Philadelphia. This insulator consists of an iron hook, for holding the wire, cemented in an elongated glass vase, the latter being cemented in a hollow cast cylinder. All parts of the apparatus susceptible of absorbing paraffine, are saturated with that substance which is now known to stand first among insulating bodies. The French Government has sent to the inventor a delicate differential galvanometer of 40,000 involutions, to test the insulators he is engaged in making for their telegraph lines, and specimens of all the insulators from every part of Europe offered in competition before the Commision.

THE WATERS OF AFFLICTION.—The men and animals of the Abysinian expedition now stationed at Annesley Bay, require a daily supply of 40,000 gallons of water. This entire amount must be distilled before it is potable, and this process is at an actual expense of fifty cents per gallon. British taxpayers therefore pay $20,000 per day, or at the rate of between seven and eight million dollars a year for this one item of expense of the expedition; in contemplating which the *Pall Mall Gazette* is forced to call these the "waters of affliction."

CONCERNING BIRDS.—In *The Naturalist*, Mr. Wallace has published a very interesting paper on the "Relation between Sexual Differences of Color and Nidification in Birds." In some few species of birds the females can boast of a plumage more beautiful and brilliant than that of the male. In cases where the female has this conspicuous appearance, the nest always conceals, her, but in cases where the female is of a dull color, the nest exposes a considerable portion of the sitting bird. When the male bird is less brilliant than his mate, it is found that he performs the duties of incubation. There seems, then, to be a connection between the color of the different sexes of birds and the sitting over the eggs. Mr. Wallace considered that Darwin's principle of natural selection most aptly explained this connection of color and nests.

FAUNA OF CALIFORNIA.—At the last meeting of the Academy of Sciences at San Francisco, Dr. Cooper read a paper on the above subject giving notes of animal species recently determined to exist on that coast. Among these, he enumerated one sea elephant as large as a walrus, two species of seals, and three of sea lions. There are sixteen species of bats in California, two of which are very large and curious. Among rodents, a link has been found between the rat and rabbit. Of birds, quite a large number of species have been added, among which we note a black hawk, the first found in the United States; the European widgeon duck, a straggler from Asia; the short-tailed Albatross; the frigate Pelican, which is rarely found north of the tropics, and a large and entirely white gull of a species never but once before found in this country. Several of these additions to the fauna of the State, were first identified and described by Mr. Cooper.

AN UNPARALLELED TELEGRAPHIC FEAT.—On Saturday the 1st inst. the telegraph operator in San Francisco held communications with the office at Heart's Content, N.F., the terminus of the Atlantic cable. After exchanging the usual complimentary messages, the circuit was still further extended the trifling distance of 2,000 miles, and a telegram was started from Valencia at 7:20 A. M., passing through New York at 2:35 A. M., and being received in San Francisco at 11:21 on the previous evening. Allowing for the differences of time, the actual time occupied in traversing this entire stretch of 14,000 miles, was only two minutes. Subsequently the operator at San Francisco transmitted an eighty-word message to Heart's Content direct in three minutes; it was repeated back by the operator at the latter office in two minutes fifty seconds.

SCIENTIFIC EXPLORATIONS IN SOUTH AMERICA.—About seven months ago we informed our readers of a scientific expedition that was about starting from Williams College for the purpose of making explorations in South America. We have now intelligence of the safe return of the company, after an absence as above stated. The party traveled in two divisions. One section started from Guayaquil upon the western coast, crossed the Eastern Cordillera of the Andes, penetrated to the river Napo, and thence by canal to steam navigation on the Amazon. The other started from Caracas upon the coast of Venezuela, struck inland to the Orinoco, and down the Rio Negro to the Amazon, traveling a distance of 2,500 miles by canoe. Much valuable information respecting the country passed through, and very extensive collections in the various departments of natural history, are the results of the expeditions.

FELINE FANCIERS will be gratified to learn that Prof. Glover has added to his museum in the Department of Agriculture, a genuine Grimalkin imported from Angora, Asia Minor. The cats of this region are said to be one of the best of the species, being very domestic in habit and expert mousers. They resemble somewhat, the famous Angora goats, in having long and silky white hair and quite a lengthy and heavy tail. Enormous prices have been paid for this breed to be placed in museums of natural history, and by the nobility of Europe as pets. The particular puss now under notice, is one of three imported by Hon. Israel S. Diehl, with a view to try the experiment of domesticating them in this country.

BEWARE OF BENZINE.—From the facility with which it removes grease spots from fabrics, this substance has come to be regarded almost as a household indispensable. But few persons, however, realize the explosive character of benzine or the dangers attending the careless handling of the liquid. Being one of the most volatile and inflammable products resulted from the distillation of petroleum, it vaporizes with great rapidity, so that the contents of a four-ounce vial, if overturned, would render the air of a moderate sized room highly explosive. The greatest care should be exercised in handling this substance, in proximity to fire, and it is important to remember that the vapor escaping from an uncorked bottle will cause a flame to leap over a space of several feet.

PETROLEUM CHAMPAGNE.—By long continued distillation at a low temperature, petroleum is made to yield a kind of hair oil which, when properly scented, is said to serve the purpose of a capillary lubricator in a very satisfactory manner. Two other products obtained under these conditions are a liniment, recommended in certain quarters for its healing virtues, and a species of castor oil, stated to possess equal medicinal value as the great original cathartic itself. These products we have seen, but the transformation of petroleum into champagne is something we have not seen, yet an Eastern paper assures us that it is done, and that from the fiery benzoles a sparkling, foaming champagne can be produced, capable of delighting the eye, tickling the palate, and gladdening the heart, and, it may be added, killing the body.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING MARCH 3, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

74,970.—FURNACE FOR HEATING BOLT BLANKS.—Abram Alexander (assignor to Alexander Bolt Manufacturing Company), Pittsburg, Pa.

I claim, 1st. The bolt blanks heating furnace herein described composed of a combination of a certain number of hollow castings or boxes forming the sides of the said furnace.

2d, The side, A, having two or more rows of holes, R R R etc., and shelves I I etc., arranged and used for the purpose set forth.

3d. Circulating water through the hollow sides of a furnace for heating bolt blanks for the purpose of dispensing with the fire-brick lining therein.

4th. In combination with the hollow cast sides or hollow made sides the pipes, Q K K L L and M, arranged substantially in the manner and for the purpose specified.

5th, In furnaces for heating bolt blanks the apron, V, in combination with one or two of the sides of the furnace, for the purpose set forth.

74,971.—CARDS FOR ARTIFICIAL TEETH.—A. Merritt Asay, Philadelphia, Pa. Antedated February 20, 1868.

I claim, 1st, The cards or slips for holding artificial teeth with the wax only on one side, substantially as above described.

2d, Printing the manufacturer's name or trade mark on one side of the slip and coating the opposite side of the same with beeswax, or an equivalent material, substantially as described and for the purposes specified.

3d, The process of preparing the sheets out of which the cards or slips are formed to receive the coating of wax on their outer surfaces, substantially as described.

74,972.—LAMP.—S. K. Ayers, Delton, Wis.

I claim a vent hole, c, in the base of a lamp burner combined with a valve, d, arranged and operating as and for the purpose described.

74,973.—SPRING BALANCE FOR SAFETY VALVES.—James Ayres, Paterson, N. J.

I claim the spring balance formed by the combination of the box or frame, A, rod, B, having a head, b, formed upon its inner end, springs, C, long hand nut, E, and rod, F, with each other, substantially as herein set forth.

74,974.—CURRY COMB.—John H. Barringer, Jr., Hillsboro, Ill.

I claim, 1st. The teeth cylinders, C, the side pieces, B, and the handle, A, when combined and arranged as described and for the purpose set forth.

2d, The cylinders, C, when provided with two or more sets of teeth, c, substantially as described and shown.

74,975.—SLAT MATTING.—William Barton, Troy, N. Y.

I claim connecting the slats and buttons which form a slat mat by means of ropes or other flexible material which passes through the slats and buttons, substantially as and for the purpose herein shown and described.

74,976.—CANE CLEANER.—Samuel Bean, Syracuse, Ohio.

I claim the plates, C C', and springs, D D', in combination with the pivoted plate, B, and frame, A, all constructed, arranged and operating substantially as and for the purpose set forth.

74,977.—DEVICE FOR CUTTING OUT BANDS AND FRONTS OF DRAWERS.—Lyman Bennet, Amsterdam, N. Y.

I claim the arrangement upon the table, A, of the guides, B D and F, press bar, C, and knife guide, E, as herein described for the purpose specified.

74,978.—MODE OF FITTING CLOTHING.—Randall Bisbee, Boston, Mass.

I claim as an improvement in the mode of manufacturing or fitting clothing or other covering for the foot and other portions of the human figure the employment of an inelastic but flexible mold made perfect in form constructed with yielding opening or apertures and provided with a device for indicating the shape or form of such openings, substantially as herein shown and described.

Also as a means of indicating and noting the size and shape of the apertures in the mold, the pointers, or their equivalents, essentially as herein shown and described.

Also the construction of the sole of the mold for the foot as divided in its center and provided with a suitable means of confining it in position, substantially as before set forth and explained.

74,979.—MECHANICAL MOVEMENT.—Marcus Bockman Brooklyn, N. Y.

I claim the frame, A A and B B, with the levers, C C, with their arms, D D, and rollers, J J, and the segment, E, and connecting bars, F F, constructed, arranged and operating substantially as and for the purpose set forth.

74,980.—SAFETY ATTACHMENT TO RAILROAD CARS.—George W. Brady, New York city.

I claim, 1st, The shields, G, when connected with slides, H, which are fitted upon tapering dove-tail or other tenons, a a, formed on the ends of the yoke, J, which rest upon the axle boxes of railroad cars, substantially as herein shown and described.

2d, The above in combination with the springs, I I, arranged as and for the purpose set forth.

3d, The yoke, J, resting upon and fitting around the axle box and extending down the side of the pedestal the said yoke having a dove-tail tenon on each end to which the metallic slide connected with the shield frame is attached.

74,981.—CORN SHELLER.—Jacob Brinkerhoff, Auburn, N. Y.

I claim the series of regulators or pressure blocks each with its independent spiral spring, combined and arranged substantially as and for the purpose herein set forth.

74,982.—PLANER CHUCK.—Rufus N. Bruce (assignor to himself and Amos Case), Springfield, Mass.

I claim a planer chuck in which the bottom plate, A, of the vise, is hinged at one side to the bottom plate, B, of the chuck, between two projecting guides, K and K, and operated at the other side by an elevating device, consisting of a screw, F, and loose nut, E, the parts being combined and arranged together substantially in the manner described.

74,983.—HARVESTER RAKE.—Robert Bryson, Schenectady, N. Y.

I claim, 1st, The laterally sliding segment, I, applied to the plate or track bed, H, by means of a slot and guide, or slots and guides, substantially as and for the purpose described.

2d, The rod, K', and guide, n, upon the draft frame, A, in combination with lever, K, and sliding segment track, I, substantially as and for the purpose described.

3d, The combination of the sliding segment, I, and its lever and connecting rods for operating it, with the track bed, G, fixed cam, H2, and a series of revolving rakes and reels, substantially as described.

4th, The combination of a sliding elevating segment track, I, with rake and reel arms, which revolve around an axis, and with anti-friction wheels, e e, applied upon said arms at different distances from their respective axes of motion, substantially as and for the purposes described.

5th, A gimbal-jointed rod, S, which is allowed to slide freely through the clutch hub, h, and which carries upon it a sliding clutch, r, in combination with spur wheels, f3 f2, longitudinal shaft, g, and spur wheels, f f1, arranged to operate substantially as described.

6th, The sliding rod, S, and its gimbal or universal joint, T1, in combination with a clutching device, r h, a rotating bearing, p, and a driver, h', substantially as and for the purpose herein described.

7th, The arrangement of the rod, K', and the slide rod, S, with its clutch, upon the draft frame of a front-cut machine, and in front of the driver, all in such relation to the driver's seat that the driver can conveniently stop or start the rakes and reels, and also cause any one of them to operate either as a rake or reel at pleasure, substantially as described.

74,984.—DOUBLE HOES.—A. Burchard, New Brenton, Ill.

I claim making them adjustable so that the blades may be set near together or further apart, as desired.

I also claim, as a means of adjusting double hoes, a cleft or forked handle provided with a screw or other device, for adjusting the separation, substantially as described.

74,985.—APPARATUS FOR DYEING PIECE GOODS.—Henry Burrows, Lowell, Mass.

I claim the combination as well as the arrangement of the series of guides, I, and either bars or rollers, K, with the reservoir, its drum, B, and roller, H the whole being to operate together as described, with a piece of cloth applied to them, in manner as set forth.

I also claim the arrangement and combination of the guide arm, L, with the system of guides, I, bars or rollers, K, drum, B, roller, H, and reservoir, A.

I also claim the combination and arrangement of the pressure roller, O, and forked arm, N, or the same and the post, M, with the reservoir, its drum, rollers, and guides, arranged as set forth.

I also claim the combination and arrangement of the roller, F, with the reservoir, A, the drum, B, the roller, H, and the system of guides, I or I and K, applied to the said reservoir, and arranged with the drum, B, and roller H, substantially as specified.

74,986.—MOWING MACHINE.—Geo. E Burt, Harvard, Mass.

I claim, 1st. The seat, T, supported by mechanism constructed and arranged in such a manner that the weight of the operator shall act to lift the cutter bar, substantially as described, for the purpose set forth.

2d, The foot lever, r, when constructed with mechanism so arranged that, when operated upon, it shall act, in conjunction with the operator's weight

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in the seat to elevate the cutter bar, substantially as described and set forth.

3d, The segment, s, the gear, v, the lever, r, in combination with the segment, H, and elevating chain, c, substantially as described for the purpose set forth.

4th, The hanging boxes, C C, the lever, D, and pivot, d, in combination with the seat, I', constructed and arranged substantially as described for the purpose set forth.

5th, The combination of the periphery rolls, f f f, the rings, J J, the revolving rim, I, and the stationary hollow ring, K, with the frame, A, constructed and arranged substantially as described for the purposes set forth.

74,987.—RAKE.—John H. Butler, Scottsville, Ky.

I claim the circular and rotary construction of the machine above described, connected with a handle, as above described, and having teeth inserted in the usual manner in the circular frame, and by means of iron hooks and staples, above described, preventing the rotary motion of the machine, at pleasure, and thereby converting it into a common rake.

74,988.—LANTERN.—John Caldwell, Providence, R. I.

I claim the combination of a lantern frame, e e' d, constructed as described, with a lamp, a, and chimney, c, in such a manner that the frame may be readily fitted to the lamp, and the chimney will form the glass of the lantern, substantially as set forth.

74,989.—SLED BRAKE.—John Cassidy, Montezuma, Iowa.

I claim, 1st, The double-locking irons, B B, bent or otherwise, forming one continuous bar, all substantially as shown and described, in combination with a sled or sleigh, for the purpose of retarding the progress of the latter, all as set forth.

2d, The lifting bar, e, substantially as shown and described, in combination with the locking irons, B B, and lever, b, all as and for the purpose set forth.

3d, The frame, n, substantially as shown and described, in combination with the roller, i, locking irons, B B, and lifting bar, e, or the equivalent thereof, all as and for the purpose set forth.

4th, The roller, i, substantially as shown and described, in combination with the locking irons, B B, and frame, n, all as and for the purpose set forth.

74,990.—PLAITER FOR SEWING MACHINE.—Hugh Cawl, Douglass Corning and James W. Wheeler, Troy, N. Y.

We claim the plates, A, B and C, and the gage, D, for the purpose of guiding the cloth as it passes through the plaiter, and regulating the width of the first plait, in combination with the additional blade or gage, E, substantially in the manner and for the purposes herein described and set forth.

74,991.—POTATO DIGGER.—W. H. Chamberlin, Medina, N. Y.

I claim, 1st, the wheels, G, formed with three curved prongs, g', and removably arranged upon the shaft, F, substantially in the manner herein shown and described and for the purposes set forth.

2d, The combination of the pronged wheels, G, shaft, F, frame, B, gear-wheels, E and D, axle, A, drive-wheels, C, and tongue, I, with each other, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the tongue, I, seats, K, bars, L J, lever, M, and catch, N, with the frame, B, and axle, A, all constructed, arranged and operating substantially as herein set forth for the purpose specified.

74,992.—IMPLEMENT.—T. C. Comstock, Harrodsburg, Ky.

I claim, 1st, The nail drawer and hammer, constructed as described, its handle, B, provided with the beak, E, and fulcrum nose, D, forming the wrench, W, and also provided with the vertical opening, H, for the passage of the nail being drawn, and the handle, A, having the sharpened vertical jaw, F, all arranged as described, for the purpose specified.

2d, The nail drawer and hammer, when provided with the beak, D, jaws, E F, opening, H, hammer, C, screw driver, G, and tack drawer, I, all constructed and arranged as herein shown and described.

74,993.—ADJUSTABLE SEAT.—Isaac Cook, St. Louis, Mo., assignor to himself and Franklin Manufacturing Company, assignors to Isaac Cook and George P. Hertnel, Jr.

I claim the seat board, A, in combination with the lever, B, the trunnion, m, supported in a rubber-bushed mortise of the stand, C, the shoulder, E, its rubber facing, u, and the check stud, F, with its rubber facing, all acting to produce a noiselessly-moving seat, substantially as set forth.

74,994.—SELF-LOADING BATTERY GUN.—T. J. Cranmer, Vallicita, Cal.

I claim, 1st, The sash or frame, R, provided with lugs for moving the slides, S S, and constructed substantially as described, and for the purposes herein set forth.

2d, The rock shaft and frame, Q, provided with teeth that move the sash or frame, R, substantially as and for the purposes herein shown and described.

3d, The construction of the lock for firing the volleys, consisting of the sliding bar, J, and dog, L, with the lug, a, hammer, M, and spring, F2, substantially as herein shown and described.

4th, The device by which the caps are placed upon the nipples, consisting of a combination of the spring, E2, dog, n, and lugs with the sliding bar, S, substantially as herein shown and described.

5th, The combination of the bopper, O2, with the tubes, p, and plates, t, lugs, g, and sash, R, operating substantially as and for the purposes herein shown and described.

6th, The construction and arrangement of the wall, S', in each powder chamber, adjusted laterally by means of the set screws to regulate the charge of powder, substantially as and for the purpose specified.

74,995.—CHURN DASHER.—Robert Crawford, Mercer, Pa.

I claim, 1st, The air vessel, D, of any suitable shape, for the purpose of displacing the cream and permitting the same to pour into the said vessel, D, and operating substantially as shown and described, and for the purpose specified.

2d, The valve, g, of any suitable form, in combination with an air vessel, thereby commingling with the air in the vessel, substantially as shown and described, and for the purpose specified.

3d, The concave radial wings, a, in combination with an air vessel, D, substantially as and for the purpose shown and described.

74,996.—PROCESS OF TREATING PAPER FOR VARIOUS PURPOSES.—Charles F. Crehore, Newton Lower Falls, Mass.

I claim the treatment, substantially as before described, of the different fabrication of paper, by combining the same with sulphur, or any combination with or equivalent to sulphur, for the purpose of producing the material or effects before explained.

74,997.—FLOATING THERMOMETER.—David B. Day, New York city.

I claim, 1st, The float, A, bent thermometer tube, B, and adjustable ballast weight, D, constructed and combined substantially as and for the purpose herein set forth.

2d, A thermometer for measuring the temperature of liquids, so constructed as to be suspended therein by means of a float making a part of the instrument, substantially in the manner and for the purpose set forth.

74,998.—ANIMAL TRAP.—John M. Dearborn, Boston, Mass.

I claim the combination of the side boards or plates, F, glass end plates, G, covering plates, H, gauze or fine grating, I, pivoted or hinged drop door or doors, B, arms, C, coiled springs, D, and arms, E, with each other and with the cover, A, substantially as herein shown and described and for the purpose set forth.

74,999.—CAR WHEEL.—Gilliard Dock, Wiconisco, Pa.

I claim the perforated projection, c, in combination with the recess, a, in the hub, A, of a car wheel, constructed an operating substantially as and for the purpose herein described.

75,000.—DENTISTS' FLASK.—George E. Donham, East Abington, Mass.

I claim in combination with the parts of a dentists' flask, and means for securing said parts together, means for allowing the parts to yield while retaining pressure on the contents of the flask, substantially as described.

Also the clamp when made so as to yield, and arranged to be used with means for securing together the parts of a dentist's flask.

75,001.—CAR BRAKE SHOE.—Gardner Drake, Farmington, Me.

I claim, 1st, The combination of the brake shoe, A, having the slot, a, and the beveled end, C, as herein described, for the purpose specified.

2d, The combination of the slotted shoe, A, with the pins, a1, bolt, a2, and block, B, as herein described, for the purpose specified.

75,002.—STRAINER FOR FLUIDS.—Wm. Dunn, Argosville, N. Y.

I claim the arrangement of a strainer within a vessel, such strainer having a wire gauze or screen in its wall, and attachments for the purpose of connecting it to one side of the vessel, substantially as and for the purpose described.

75,003.—METHOD OF EXCAVATING UNDER WATER.—Alfred Duvall, Baltimore, Md. Antedated Feb. 28, 1868.

I claim, 1st, the receiving box, C, forming a horizontal portion of the pipe leading from the excavator to the pump, constructed with doors to give access to its interior, and submerged in water, or otherwise made air tight, substantially as set forth.

2d, The combination of the pump, A, receiving box, C, and screen, E, pipe, F G, and vertically working excavator, K, substantially as and for the purpose set forth.

3d, The combination of the receiving inlet, I, and excavator, K, respectively constructed and arranged to operate substantially as set forth.

4th, The combination of the excavator, K, vertical shaft, J, and stationary cylinder, L, with revolving piston, for supporting the shaft, substantially as set forth.

5th, The arrangement of the hull of the boat with a partition, V, valve, T, and pump, M, for regulating the depth of the excavator, either when at work or for the purpose of adjusting the shaft, substantially as set forth.

75,004.—MODE OF EXCAVATING UNDER WATER.—Alfred Duvall, Baltimore, Md. Antedated Feb. 28, 1868.

I claim, 1st, The combination of the pump, A, receiving box, B, valve F, tubes, E, and pipes, 1, the latter two being connected by a universal joint, H substantially as set forth.

2d, The combination and arrangement of the stationary tubes, E, horizontally and vertically movable pipes, I, cord, J, and windlass, K, substantially as set forth.

3d, The combination and arrangement of the pipes, I and E, receiving box, B, screen, C, pump, A, and trough or series of troughs, P, substantially as and for the purpose set forth.

4th, The receiving box, B, with the adjustable valve, F, and screen, C, and external water box, D, constructed and arranged substantially as set forth.

75,005.—SEEDING MACHINE.—Andrew R. Eggleston and Charles F. Swain, Milwaukee, Wis.

We claim, 1st, The combination with the rotating feed cups, of the overlapping stationary sockets or shields, substantially as set forth, for the purpose described.

2d, The combination of the feed cups, the gage plate, and the shut-off slide, substantially as set forth.

3d, The combination of the windlass, the hand lever, and drag bars, with lifting chains, arranged as described, whereby the plows are lifted by the backward movement of the lever, as set forth.

75,006.—HORSE RAKE.—John Eliot, Vermillion, Ill.

I claim the hay gatherer when provided with teeth, B, having the rearward extensions, to the under side of which and the head, A, the runners, C, are secured, as herein shown and described.

75,007.—TWEER.—Benjamin Fish, Mechanicsburg, Pa.

I claim the improved tweer herein described, constructed and arranged substantially as set forth.

75,008.—BAG TIE.—L. H. Gano, Milwaukee, Wis. Antedated Oct. 18, 1867.

I claim the lever, a, provided with its tooth, c, in combination with the elastic link, b, the spurs, d d, and the links, b' b'', arranged and operating substantially as described.

75,009.—WATER WHEEL.—M. D. Grow, Fort Dodge, Iowa.

I claim the bell-shaped wheel, A, provided with the spiral buckets, S L, and having its upper edge and guide band, E, arranged in relation to the annular chute plates, B B', substantially as herein shown and described.

75,010.—APPARATUS FOR VENTILATING WATER CLOSETS.—Frederick Hainsworth, Chicago, Ill.

I claim a water closet ventilator consisting of the case, D, pipe, B G, and valve, A, substantially as described.

75,011.—STEAM BLOWER.—Jonathan Hainsworth, Chicago, Ill. Antedated Feb. 24, 1868.

I claim, 1st, The arrangement of the vertical shaft, G, and steam cup, D, as and for the purposes set forth.

2d, The arrangement of the vertical hollow center, I, and shaft, G, as and for the purposes specified.

3d, The combination of the cup, D, steam duct, C, and center, B, as and for the purposes set forth.

75,012.—TRAVELER FOR FURLING SAILS.—George Hart, New Bedford, Mass.

I claim a traveler with friction rolls running in a guide, for hauling in and out square sails, as herein set forth and described.

75,013.—RAILROAD GATE.—Andrew Hartman, Canton, Ohio. Feb. 22, 1868.

I claim, 1st, The combination of the rods, F H J, box, G, spring, q, slide, I, and, nut, n, the several parts being arranged in the manner and for the purpose herein specified.

2d, The combination of the lever, A, and the springs, d' and x, the several parts being arranged as and for the purpose herein set forth.

3d, The combination of the gates, o o', rods, K l, and arms, i l k, spring, s, and box, m, the several parts being arranged in the manner and for the purpose specified.

4th, The peculiar arrangement of the irons, t t', levers, r r' catches, L L', slotted irons, v v', rods, u u', and stops, h h', the several parts being used as and for the purpose herein specified.

5th, The peculiar arrangement and combination of the gates, levers, rock shafts, rods, springs, boxes, slides, catches, and slotted irons, as herein shown, the whole forming a self-operating apparatus, in the manner and for the purpose herein specified.

75,014.—BOTTLE.—Gibbons G. Hickman, Coatesville, Pa.

I claim the conical tube, D, projecting obliquely downward and inward from the side of the bottle, A, to a point very near the bottom thereof, as and for the purposes shown and described.

75,015.—HYDRAULIC PRESS.—Chas. W. Holbrook (assignor to himself, Wm. Boardman, and Charles G. Bayler), New York city.

I claim the combination and arrangement of the movable platen, C C, rods, K K K K, toggle joints, H H H, and arms, E E E, with the central cylinder motor, all substantially as described.

75,016.—REVOLVING FIRE-ARM.—George Holman, Waterville, N. Y.

I claim, 1st, The plugs, E E', in the ends of the central hole, a, of cylinder D, in combination with the rod, F, on which said cylinder is fitted, all arranged substantially as and for the purpose set forth.

2d, The providing of the cylinder, D, with alternate rifled and smooth bores, e f, smaller in diameter than the bore of barrel, C, substantially as and for the purpose specified.

3d, The attaching of the spring, I, which operates the stop lever, J, to the front side of the hammer, H, for the purpose of insuring strength and durability.

75,017.—TRUNK CASTER.—Lewis Horton and Josiah A. McGaw, Manchester, N. H.

We claim the trunk caster consisting of the plate, a, to which the plate, b, is hung by the pin, c, said plate bearing between the two arms, e, the corrugated roller, d, all constructed as described, whereby the plate, a, is secured in place without the pin, c, entering the bottom of the trunk, and the plate, b, allowed to revolve in contact with the plate, a, without leverage, as herein shown and described.

75,018.—DUST RING FOR WATCHES.—Edward Howard, Boston, Mass.

I claim the method of attaching the dust ring, a, to the lower or dial plate of a watch movement, by means of a bevel or snap edge on said plate, engaging with a corresponding edge in the dust ring, substantially as and for the purpose set forth.

75,019.—SHOT CARTRIDGE.—Wm. O. Howard, New York city. Antedated Feb. 22, 1868.

I claim the combination with the fibrous elastic covering, A, and shot, B, of a coating of adamantine, stearine, or equivalent substance, substantially as and for the purpose specified.

75,020.—CAR REPLACER.—Charles Hurst, New York city.

I claim the sliding axles, D D', ratchet bars, F, axle, H, having pinions, c, screw shaft, I, arms, f h, and nuts, g, in combination with the flanged wheels E E', and car, A, whereby a vertical and lateral adjustment of the flanged wheels, E E', is obtained, substantially as herein shown and described, for the purpose specified.

75,021.—MACHINE FOR JOINTING STAVES.—Chas. B. Hutchinson, Auburn, N. Y.

I claim, 1st, The combination of the right and left hand screw, G, pivoted nuts, L L, and pivoted side pieces, E E, carrying saw arbors and saws, all constructed and arranged to operate to adjust the saws to different width of staves, substantially as described and for the purposes set forth.

2d, The combination of clamping levers, C c, with the carriage, B, when constructed and operating substantially as described.

75,022.—SLIDE FOR EXTENSION TABLES.—Nicholas Jenkins (assignor to himself, George Brown, and Charles F. Bliss), New York city. Antedated Feb. 20, 1868.

I claim, 1st, The circular form of the metal plate, N, when arranged relatively to the slides, A B, etc., and to the concentric fastening which secures it, substantially in the manner and for the purpose herein set forth.

2d, The stop, N, centrally arranged relatively to the slides, A B, etc., with the blocks, G, receiving the same, substantially in the manner and for the purpose herein set forth.

75,023.—FRICTION DRIVER.—John T. Jones (assignor to the Singer Manufacturing Company), New York city.

I claim the combination of the hub, friction clamp, two rocking cams, and two operating levers, arranged at the same side of the hub, substantially as before set forth.

Also the combination of the hub, friction clamp, two rocking cams, operating levers, and reciprocating driver, substantially as before set forth,

Also the comoination of the hub, friction clamp, two rocking cams, operating levers, reciprocating driver, transferrer, and gage, substantially as before set forth.

Also the combination of the hub, rocking cam, lever, reciprocating driver, transferrer, gage, and holding mechanism, substantially as before set forth.

75,024.—FRICTION DRIVER.—John T. Jones (assignor to the Singer Manufacturing Company), New York city.

I claim the combination of the hub, split ring, and cam, substantially as before set forth.

Also, the combination of the hub, split ring, cam, and operating lever, substantially as before set forth.

Also, the combination of the hub with two sets of split rings and cams, substantially as before set forth.

75,025.—BEDSTEAD FASTENING.—William Johnston, Appleton, Wis.

I claim the part, D, when made in two sections of segmental form, secured together by the single pin, P, in combination with the rings, R R, joined together and cast in one piece, and bearing upon one side the necks, s s, and catches, k, as herein described, for the purpose specified.

75,026.—CONSTRUCTION OF VEHICLES.—George P. Kimball, San Francisco, Cal.

I claim, 1st, The combination of the perch, A, and jack, P, with the bars, J J, and H H, substantially as described, and for the purposes set forth.

2d, The combination of the bar, D, plate, O, bolts, I I, braces, G, and perch, A, substantially as described, and for the purposes set forth.

3d, The combination of the screw plate, C, and nut, C, with eye-bolt, S, substantially as described and for the purposes set forth.

75,027.—MOLD FOR ARTIFICIAL TEETH.—Almas A. Knowlton, St. Albans, Vt.

I claim, 1st, Forming the back part of the mold in two pieces, B and C, the division line being located substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the screws, h, with the back part, C, of the mold, substantially as herein shown and described, and for the purposes set forth.

3d, Forming the holes for the platina pins in plain incisors and canines in the bevelled edge of the part, C, and at an angle of twenty degrees or thirty degrees with the plane of the position of said teeth when in the mouth, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the screws, d, with the parts, B C, and A, of the mold, substantially as herein shown and described, and for the purpose set forth.

5th, The combination of the pins, f, with the parts, B and C, of the mold, substantially as herein shown and described, and for the purpose set forth.

75,028.—SNOW-CLEARER.—Samuel Lewis, Brooklyn, N. Y.

I claim the combination of the tilting rear box, 6, frame, 12, brace, 8, windlass, 17, and lever, 13, all arranged and operating substantially as described, for the purpose specified.

75,029.—ICE-PLANING MACHINE.—Samuel Brooklyn, N. Y.

I claim, 1st, The adjustable knife, 7, in combination with a frame mounted on runners, 20 20, and all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

2d, The manner of attaching and bracing the knife, 1, of an ice planer, with its flat side downward, by the bolts, 2 2, braces, 3 3, taper washers, 5 5, and nuts, 4 4, substantially as described, and with the objects specified.

3d, The slots, b b, in the knife, 1, when in combination with bolts, 2 2, braces, 3 3, washers, 5 5, and nuts, 4 4, for the purpose explained.

4th, The vertical cutters, 9 9, formed, attached, and operating as described, and combined with the knife, 1, and its attachments, as shown.

5th, The runners, 11 11, when made reversible and adjustable as described, by means substantially as shown and combined with an adjustable knife and vertical cutters, all as specified and explained.

6th, The brake or elevator, 16, in combination with the chain, 17, and windlass, 14, applied and arranged to operate in the manner substantially as and for the purpose specified.

75,030.—BOSOM PAD.—H. W. Libbey, Cleveland, Ohio.

I claim, 1st, A breast form or pad, having a rigid base, A, and a flexible rubber front, provided with a valve at the nipple, and padded or stuffed, substantially as herein described.

2d, The valve, c, as arranged, in combination with the elastic covering, C, and nipple, F, for the purpose and in the manner substantially as set forth.

75,031.—BOSOM PAD.—H. W. Libbey, Cleveland, Ohio.

I claim, 1st, The diaphragm, A, membrane, B, and elastic covering, C, combined and arranged substantially as specified,

2d, The nipple, D, and valve, E, combined and arranged substantially as and for the purpose specified.

75,032.—COMPOUND PUNCHING AND UPSETTING APPARATUS.—Samuel E. Lockwood, Westbury, N. Y.

I claim the improved machine herein described, consisting of the stationary head block, C, sliding head block, D, connecting rod, F, eccentric, E, upon shaft, G, eccentric disk, H, with its lever, I, stationary blocks, J, and sliding block, J', having serrated projections, i i', toothed eccentric wheels, k', and punch, n, die block, O, and openings, r S, all constructed and arranged as described, for the purposes specified.

75,033.—REFLECTOR.—J. A. J. Logan, Moline, Ill.

I claim an improved article of manufacture, the concave metallic reflector A, made in one piece, with its shank, C, when said shank is formed with a shoulder, B, arranged as described.

75,034.—STEAM ENGINE CUT-OFF.—Henry O. Lothrop, Milford, Mass.

I claim the improved "cut-off" regulating mechanism herein described consisting of the auxiliary valves, K L, operated by the cams, c and d, applied to the shaft, e, and slides, i, the whole operating in combination with the main valve, D, and cylinder ports, B and C, to produce the results before set forth and explained.

75,035.—FRUIT GATHERER.—Virgil H. Lyon, Plainfield, Ill.

I claim, 1st, The head, A, fingers, C C C C, B B B B, in combination with sack, S, when formed, constructed, and arranged, in the manner herein described, and for the purpose set forth.

2d, The sectional rod, D, in combination with head, A, when constructed and arranged substantially in the manner as herein shown, and for the purpose set forth.

75,036.—CATAMENIAL SACK.—Charles Manheim (assignor to E. L. Perry), New York city.

I claim the catamenial sack, constructed as described, from one piece, in such a manner that the bags, B C D, are only formed when the sack is partially folded, as herein shown and described.

75,037.—WINDOW SHADE.—Charles G. Matchett, Greenville, Ohio.

I claim, 1st, The arrangement of gravitating catch, H, with the riband, F upper roller, B, and bands, C C', for the purpose set forth.

2d, The arrangement of cord, I, tassel, J, and lower roller, E, for the purpose set forth.

3d, The combination of the two rollers, B E, bands, C C' F, catch, H, and cord, I, substantially as and for the purposes set forth.

75,038.—PRESS FOR PACKING SHRED TOBACCO.—David C. Mayo, Richmond, Va.

I claim the combination of the lever and counterpoise, d, and connecting rods, b1 b2, and slides, B B, cross head, E, plungers, e e, with filling tubes, f f, all arranged substantially as herein described.

75,039.—FURNACE FOR GENERATING STEAM.—David Neilson Melvin, Buffalo, N. Y.

I claim, 1st, Constructing a steam boiler of one or more inverted conical water tubes, B, each separate and independent of the others, substantially as set forth.

2d, The mode of sustaining the said tubes, B, in the metallic plates, E E, as herein described, to allow of their expansion and contraction.

3d, Constructing furnaces having inclined grates, with a bridge or partial diaphragm, K, at the center, for dividing the draft, in combination with the combustion chamber, D, and side escape flues, p p, substantially as and for the purpose set forth.

4th, The door, f provided with arm, h, and weight, g, and hinged so as to be self-operating and self-sustaining, substantially as specified.

5th, The arrangement of the tubes, B, heating chambers, C, and flues, p p, whereby the heat through the latter comes first in contact with the enlarged upper surfaces of the tubes, and is thence retarded as it descends, substantially in the manner and for the purpose set forth.

6th, The series of dampers, q q, in flue, G, in combination with the tubes B, heating chamber, C, apertures, p, and furnace, D, provided with a bridge K, arranged as described, for regulating and equalizing the draft among the said tubes, as specified.

75,040.—COMBINED BOOK COVER AND STAND.—William Milliken, Cambridge, Mass.

I claim, 1st, The combination of the covers, A A, and the adjustable frame or stand, B B, substantially as and for the purpose set forth.

2d, The adjustable bars or supports, E E, in combination with the adjustable frame, B B, and cover, A A, substantially as and for the purpose set forth.

75,041.—MACHINE FOR BORING POSTS.—B. F. Mohr, Mifflinburg, Pa.

I claim the combination of the levers, H J, and K, and M, with the pin, f, notch, h, and notches on the bar, L, of carriage, E, or its equivalent, all constructed and operating in manner substantially as above set forth and described.

75,042.—AIR-CONDENSING APPARATUS.—Halsey Moore (assignor to himself and Aaron W. Knapp), Bangall, N. Y.

I claim, 1st, The rock-shaft, D, with which the piston rods of the air pumps or condensers, A, are connected, operated by means of the sliding weights, G and H, moving back and forth upon the slotted arms, F, attached to said shaft, D, substantially as herein shown and described, and for the purpose set forth.

2d, The weights, G and H, moved back and forth upon the slotted arms, F from the working beam, P, by means of the connecting rods, I, levers, J connection rods, L, bent or elbow levers, M, and connecting rods, O, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the toothed segment, R, toothed segment, S, working beam, T, connecting rods, U, crank, V, and shaft, W, with each other and with the working beam, P, to impart motion to said beam, substantially as herein shown and described.

75,043.—COAL SIFTER.—Duncan Morrison, Portland, Me.

I claim the arrangement of the several devices hereinbefore described, in the manner set forth, and for the purposes specified.

75,044.—LIQUID COOLER.—Robert Morton, Stockton-on-Tees, Eng.

I claim the arrangement of a series of flat tubes, A, which are alternately provided with longitudinal ribs, c, and connected by corrugated strips, d substantially as and for the purpose described.

Also, the caps, C, in combination with the tubes, A, ribs, c, and connecting strips, d, constructed and operating substantially as and for the purposed scribed.

75,045.—COFFEE POT.—Joseph Nason, New York city.

I claim the employment of two cocks, communicating respectively with the upper and lower parts of the chamber of a duplex coffee urn, the several parts being constructed and arranged for joint operation, substantially as and for the purposes herein set forth.

75,046.—COOKING STOVE AND RANGE.—Benjamin Nott, Albany, N. Y.

I claim a base burning stove, so arranged and constructed as to admit the feeding and burning of the coal at the rear of the fire pot, in combination with lateral flues, surrounding ovens at the sides thereof, for the purposes making radiating fire surface at the front, or at C, for cooking purposes, in addition to the baking in the ovens, substantially as described.

Also, in combination with a base-burning stove, constructed as described the auxiliary supply openings, for the introduction of lighter fuels, substantially as and for the purpose described.

75,047.—COLLAR AND NECK-TIE COMBINED.—George F. Perkins, New York city.

I claim the reversible paper cravat, B, on the lower edge of one end of the collar, and cut in one and the same piece with the latter, adapted to be folded into said collar above the line, a, and its free end inserted in the opposite end of the collar, as herein shown and described.

75,048.—SHOE.—Charles Perley, New York city.

I claim, 1st, The padding, applied at f, within the rear portion of the shoe for the purposes and substantially as specified.

2d, The tongue, d, stiffened with a padding, that also equalizes the pressure of the lacing on the foot, substantially as set forth.

3d, The buttons or fastenings, along the tongue, d, between the flaps, g g, to hold said tongue properly in place as specified.

75,049.—BILLIARD-CUE TRIMMER.—Hypolite Pernot, New York city.

I claim, 1st, A billiard-cue trimmer, A, consisting of a roughened or toothed concave or flat plate, substantially as herein shown and described.

2d, A billiard-cue trimmer, consisting of two or more roughened plates, A' A', fitted into one handle, B', substantially as described, so that different kinds of cues may be trimmed by the same implement, as set forth.

75,050.—TIRE-HEATER.—C. E. Pierce, St. Charles, Ill.

I claim, 1st, Placing the tire box, B, upon the forge, A, and making it an integral part of the forge and chimney, substantially as herein shown and described, and for the purpose set forth.

2d, The arrangement of the shifting rollers, C E, in the annular tire box, B whereby the smaller tire is hung upon the roller, C, in the upper part of the flue, and the larger tire rests upon and is operated by the roller, E, in the lower part of the flue, as herein described, for the purpose specified.

3d, The combination of the apron, H, with the lower part of the door, G or tire box, B, substantially as herein shown and described, and for the purpose set forth.

75,051.—CONNECTING ROD.—E. S. Pierce, Hartford, Conn.

I claim, 1st, An improved connecting rod, constructed and operating substantially as herein set forth.

2d, The combination of the devices, C F G, and S, or their equivalents, substantially as specified.

75,052.—EXTENSION LADDER.—Benjamin Pine (assignor to Charles E. Hartshorn), New York city.

I claim an extension ladder, composed of two parts, A B, fitted together, and connected by endless chains, C C, all arranged to operate substantially in the manner as shown and described.

75,053.—FURNACE DOOR LATCH.—Jos. L. Reilly, Chester, Pa.

I claim, 1st, Providing a furnace door with a latch, E, which can be locked into a catch, D, for the purpose of holding the door open, substantially as herein shown and described,

2d, The bolt, B, of a furnace door, when arranged as described, so that serves to hold the door open and to keep it closed, substantially in the manner herein set forth.

75,054.—PLOW WHEEL.—E. S. Rice, Paw Paw, Mich.

I claim the combination of a removable collar, C, with the wheel, D, axle B, and standard, A, said collar being removably attached to the said standard, and passing around a flange formed upon the hub or axle of the wheel substantially as herein shown and described, and for the purpose set forth.

75,055.—CAR COUPLING.—Silas O. Rogers, Jr., Stanfordville, N. Y.

I claim the tumbler, C, constructed substantially in the form and manner herein shown and described, the slide bar, E, coiled spring, F, or equivalent and lever, G, in combination with each other and with the bumper-head, B substantially as and for the purpose herein set forth and described.

75,056.—WATER WHEEL.—Norman Rose, and E. W. Wright, Milford, N. Y.

We claim the buckets, e, at the central or main part of the wheel, D, in

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combination with the adjustable buckets, f f, at the top and bottom of the same, substantially as and for the purpose specified.

75,057.—STEAM GENERATOR.—Sylvanus Sawyer, Fitchburg, Mass.

I claim the combination of the detached fire-box, the steam drums or chambers, and the main boiler, arranged substantially as described.

75,058.—COMPOSITION FOR FORMING CASTS AND FANCY ARTICLES.—Michael Schall, New York city.

I claim a composition formed of the ingredients herein named, for the purpose described.

75,059.—INJECTOR FOR FEEDING BOILERS.—William Sellers, Philadelphia, Pa.

I claim, 1st, The hole, c, in the end of the plug, which plug regulates the discharge of steam in the injector, substantially as herein set forth.

2d, The flange, d d, substantially as set forth.

3d, The discharging tube, K, constructed substantially as described.

4th, The arrangement of the waste orifice, W, substantially as specified.

75,060.—LATHE TOOL.—Thomas Shaw, Philadelphia, Pa.

I claim the combination of holder, a, with cutter bit, b, and wedge, c, in the manner and for the purpose described.

75,061.—TRUSS.—Jacob A. Sherman, New York city. Antedated Feb. 20, 1868.

I claim, 1st, Uniting the bars, a a, by a hinge, in combination with an adjustment applied between the lapping ends of such bars, substantially as and for the purposes specified.

2d, Applying the spring that carries the hernial pad, between the bar, n, and the person, and fitting the same to slide, at one end, on the said bar, a, substantially as set forth.

3d, The plates, m and n, attached together by a screw, and united, at the end of the plate, m, by a hinge, to the truss pad, and at the end of the plate, n, to the spring, l, so as to regulate the position of the hernial pad, as specified.

4th, The screw, t, in combination with the pad plate, o, and plates, m and n, as and for the purposes specified.

75,062.—LOOM.—Jacob Silbermann, and Gustav Unger (assignors to themselves and Jacob Heinemann), New York city.

We claim, 1st, A reed, supported in slides in the lay, in combination with mechanism, substantially as described, that gives and end movement to said reed each reciprocation of the lay, in order that the wider portion of the diverging reed may come into the warps where they stand wider apart near the heddles, for the purposes and as set forth.

2d, The cam, q, lever, p, link, n, and shaft, l, or its equivalent, in combination with the lay and diverging reed, fitted to slide in the lay, and operate in the manner and for the purposes set forth.

75,063.—HAND-SPINNING MACHINE.—Anthony W. Silvis (assignor to himself and Samuel B. Shott), Birmingham, Iowa.

I claim, 1st, The carriage, C, in combination with the feed-roll, D, guide rail, F, spool, E, catch, g, and pin, t', all operating as described, whereby, as the catch, g, strikes the pin, t', the feed roll, D, is dropped upon the wheel, a, of the carriage, and the guide rail, F, releases the roping to be fed to the spindles, as herein shown and described.

2d, The combination of the carriage, C, having the operating mechanism, the cord, m, sheave, n, rods, s, shaft, f, clutch pulley, p, levers, r r', and finger, q', as herein described for the purpose specified.

3d, The slide, y, connected with the drop, z, and operated by the carriage C, as and for the purpose specified.

75,064.—CHANDELIER.—Russell J. Skinner (assignor to J. W. Scott & Co.), Chicago, Ill.

I claim the hollow or solid extension rod, H, and the india-rubber or other elastic strap, straps or hose, G, placed inside or outside of the said rod, H, both combined, arranged and operating substantially as herein described and specified to be used for raising and lowering chandeliers, substantially as herein set forth.

75,065.—FUNNEL.—Thomas W. Slade, Manchester, Mass.

I claim the funnel, as made, with the body and ajutage in separate parts and provided with a bayonet connection to hold them in connection, as set forth.

Also, the arrangement and combination of the cross bar or rest, P, with a liquor funnel composed of a conical mouth piece and an ajutage or discharge nozzle.

75,066.—CLOTHES WRINGER.—H. E. Smith, New York city.

I claim the spring posts, A A', when provided with the adjusting screws, g g', in their legs, e e', combined with the rollers, B B', and the compensating gearing connecting them, arranged and operating substantially as and for the purpose herein described.

75,067.—COMPOSITION FOR ARTIFICIAL IVORY.—Alfred Starr (assignor to William M. Welling), New York city. Antedated February 24, 1868.

I claim the composition, made substantially as set forth, for forming an artificial ivory, as specified.

75,068.—PUNCHING MACHINE.—Charles Steinbach, Lima, Mich.

I claim a punch moved by a crank, which may be set at any desired angle, as herein specified and for the purposes set forth.

Also, the adjustable parallel rulers, substantially as herein specified.

75,069.—GANG PLOW.—George Steinegger, Highland, Ill.

I claim the swinging beams, B B', when lifted by the lever, b, and link, h, substantially as shown and described, in combination with the lateral braces, l, eye plates, i, and bolts, k, or their equivalent, all as and for the purpose set forth.

75,070.—HARVESTER.—W. H. Stevenson, Auburn, N. Y.

I claim, 1st, In a two-wheel double-hinged joint harvesting machine, the combination of the spur wheels, I H E, with a dished driving spur, D, which will allow of the arrangement of the pitman crank shaft, J, substantially as and for the purposes described.

2d, The arrangement of the wheels, D E H I, the wheel, E, being placed loosely on its shaft, F, constructed with a clutching face, f, and provided with a latching lever, G, substantially as described.

3d, The construction and arrangement of the adjustable shifter, holder, and guide, constructed in one piece, and made fast to the draft frame, by bolts passing through one or more slots, to enable the shifter to be moved back and forth to adjust its fork to the groove in the spur pinion, substantially as described.

4th, The arrangement of the adjustiug lever, T, linked connection, L, and segment slide, S, working loosely in a guide box, k, which does not extend below the draft frame, in combination with the drag bar, P, all substantially in the manner shown and described.

75,071.—SLEIGH BELL.—George M. Strong, Boston, Mass.

I claim the riveted eye bolt, C, in combination with the tongue, T, bell, B, and strap, A, substantially as described and for the purpose set forth.

75,072.—CURTAIN FIXTURE.—Alvan Studley, Natick, Mass.

I claim a socketed head, i, jointed or hinged so as to be capable of being turned laterally against and be held in place by a spring, k.

Also, the window curtain roller end bearing, as composed of the cylindrically socketed head, i, the arm, G, the spring, k, and the carrier, H, arranged so as to be applied to the curtain roller and window frame, and to operate with respect to the roller, substantially as specified.

Also, the combination of the cylindrical case, E, having a bearing, r, at its outer end, with the roller, C, having a shoulder, x, for the inner end of the case to rest against, and a journal, g, to enter the bearing or socket, h, of the head, i.

Also, the combination of the cylindrical journal and roller with a pivoted or hinged socket, to move laterally, substantially as and for the purpose described.

75,073.—ASH PAN OF COOKING STOVE.—George W. Swett, Troy, N. Y.

I claim, 1st, The ash pan drawer, A, having the rear part thereof, extending under the fire chamber, so constructed as to receive the ashes or other matter falling from the combustion chamber while the front part of the top thereof is closed, and the whole arranged and combined in the manner substantially as herein described and set forth.

2d, The combination of the ash pan drawer, A, or its equivalent, with the fire chamber or chamber of combustion, B, and so arranged in the hearth of a stove as to form the air flues or chambers, f g i and j, in the manner and for the purposes substantially as herein described and set forth.

3d, Constructing the hearth of a stove with dampers and a flue or flues therein for the purpose of conducting atmospheric air from the room or place where the stove is used into the said ash pan drawer, A, and to the bottom of the said hearth, substantially as herein described and set forth.

75,074.—HAME FASTENER.—Alvah Sweetland (assignor to himself and Milton J. Palmer), Syracuse, N. Y.

I claim the lever, C, and slot, F, in the lever, and these parts in combination with each other and the slot of the strap, constructed and operating in the manner and for the purpose substantially as described.

75,075.—FISHING TACKLE.—D. C. Talbot, Holden, Mass.

I claim the arrangement of the weight, C, the loop, g, the spring, i, and the pin, j, in combination with a signal flag and staff and fishing pole, substantially as described and for the purposes set forth.

In combination with a fishing pole or tackle, the flag staff, B (with the weight, C), when attached to the pole and operated substantially as described, either with or without a reel.

75,076.—BASE FOR BALL PLAYERS.—Esau D. Taylor, Hornellsville, N. Y.

I claim the stake, A, pin socket, B, swivel cap, D, and cushion or sand bag, E, all in combination, to be used for the base or bounds for base ball players, substantially as and for the purposes herein set forth.

75,077.—SHEEP RACK.—Jacob Taylor, Beloit, Ohio.

I claim, 1st, The trough, C, open at one end, and consisting of the bottom, C, inclined boards, c', and perpendicular side pieces, in combination with the frame, A, and sliding racks, substantially as described, for the purpose set forth.

2d, The combination of the upright sliding side racks, D, with the frame, A, and slats, B, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the movable rack, E, with the frame, A, slats, B, and sliding racks, D, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the end board, e2, with the forward end of the rack, E, and with the trough, C, substantially as herein shown and described and for the purpose set forth.

75,078.—FURNACE FOR DECARBONIZING PIG IRON FOR THE PRODUCTION OF STEEL.—Alois Thoma (assignor to himself, S. Bromberg and A. W. Wilder), New York city.

I claim 1st, The arrangement of the partitions, i i, in the channels, a, for more thoroughly heating and burning the gases on their passage to the decarbonizing chamber, as set forth.

2d, The perforated walls, D D, arranged between the ends of the channels, a, and the chamber, B, to allow the gases to gather in the chambers, K, thus created, and to be cooled therein, as set forth.

3d, Conducting the gases from the chamber, B, to a chamber, G, through which the pipes, H, are laid, in which air is conducted to the channels, a, to aid the combustion of the gases in said channels, so that, by means of the gas discharged from the furnace the air entering the same is heated, as set forth.

4th, The channels, a, partitions, i, air chambers, H, perforated walls, D, decarbonizing chamber, B, channels, o and p, chamber, G, and pipes, H, all arranged as described, in combination with each other, and all operating substantially as and for the purpose herein shown and described.

75,079.—HEMMER FOR SEWING MACHINE.—W. H. Thomas, Galveston, Ind.

I claim the deflector, dx, in combination with the guides, a b c, substantially as and for the purpose specified.

75,080.—SOCKET FOR CASTER.—Alexander C. Twining, New Haven, Conn.

I claim, 1st, The socket or stock, made with ridges edged, or nearly so, in planes acutely and equally inclined to the axis of the socket, as and for the purpose described.

2d, The valleys, along the ridge bases, for an increased prevention of splitting, as herein described.

75,081.—DYERS' VAT.—William Vine and William H. Jubb, Norwalk, Conn.

We claim the arrangement of the double vat, A and B, with hoisting attachments, in the manner substantially as herein set forth and for the purpose described.

75,082.—MACHINE FOR FINISHING CARD HANDLES.—Increase S. Waite, Hubbardston, Mass.

In a machine for tenoning card-board handles, I claim the rotary cutter head, with the curved concave flange, i, provided with the cutters, g and k, the cutter head, B, with the cutters, h, the rest, G, and guide, H, constructed and operating substantially as described.

75,083.—TRAVELING BAG.—William Wakenshaw (assignor to T. B. Peddie), Newark, N. J.

I claim the fastenings, D D, constructed of the form and applied to the bag in the manner substantially as shown and described.

75,084.—DRILL SHARPENER.—Elisha W. Walton, Drytown, assignor to Joseph H. Atkinson, San Francisco, Cal.

I claim the combination of the swage, frame, and die, in combination with a stirrup lever and an eccentric, for the purposes specified, all constructed and arranged substantially as described and shown.

75,085.—BEER FAUCET.—Frank J. Walz and Charles Steck, Hudson, N. J.

We claim the combination of the pump barrel, E, having side and end perforations, e and e', the plunger, F, and spring, K, arranged and operating in connection with the faucet, so as to commingle air with the liquor during its discharge, substantially as and for the purpose herein specified.

75,086.—SIGN FOR STREET LAMP.—William Powell Ware, New York city, assignor to himself and James J. De Barry, Brooklyn, N. Y.

I claim the transparent signs herein described, composed of perforated metal, A, and opaque material, B, combined and arranged so as to serve in the manner and for the purposes and advantages herein specified.

75,087.—HEAT RADIATING ATTACHMENT TO STOVES.—B. J. Watson, Troy, Wis.

I claim, 1st, A flue attachment for stoves, consisting of the chambers, G and H, and pipe, F, substantially as shown and described, and for the purposes set forth.

2d, The chambers, G and H, in combination with a stove, S, and pipe, F, and damper, a', substantially as shown and described and for the purposes set forth.

3d, The chamber, G, in combination with the pipe, A, and the chamber, H, in combination with the pipe, B, and damper, a', substantially as shown and described, and for the purposes set forth.

75,088.—PUMP.—J. R. Weisiger, Danville, Ky. Antedated February 28, 1868.

I claim, 1st, The construction and arrangement of the hollow shaft, I, having at its lower end the hollow head, J, provided with valve, M, the uprights, P, arms, Q, rack, O, and pinion, all operating as described, for the purpose specified.

2d, The arrangement of the radial plates, E, having valves, G, hollow head, J, having valves, M, hollow shaft, I, cylinder, A, uprights, P, rack, O, arms, Q, and pinion, as herein described, for the purpose specified.

75,089.—RATCHET HEAD AND LEVER.—T. A. Weston, Buffalo, N. Y.

I claim the ratchet lever head, when constructed with teeth, e e e e e, and pawls, c c c c, combined, arranged, and operating substantially as and for the purposes shown and described.

75,090.—RATCHET HEAD AND LEVER.—T. A. Weston, Buffalo, N. Y.

I claim, 1st, In a ratchet lever with a series of differential teeth and pawls, b c, as described, the construction and arrangement of parts as herein set forth, consisting of the feed screw, D, socket, f, the barrel, A, turning thereon, and operated by lever, B, the ratchet head, C, secured to the screw by the pin, d, and the washer, k, for retaining the springs in place, the whole operating in the manner and for the purpose specified.

2d, The jointed lever, B, in combination with the devices thus constructed, substantially as set forth.

75,091.—RATCHET BRACE.—T. A. Weston, Buffalo, N. Y.

I claim, 1st, The combination of two ratchet heads, D E, an intermediate pawl barrel, A, and the locking device, which may shift from one end to the other to engage and disengage the said heads, substantially as set forth.

2d, The combination of the shifting slide, I, and tightening screw, n, or equivalent, with the ratchet heads D E, and pawl barrel, A, substantially as herein set forth.

75,092.—RATCHET BRACE OR LEVER.—T. A. Weston, Buffalo, N. Y.

I claim the special construction and arrangement of the double ratchet head, B, with the end of the lever, forming a strap, a, resting centrally between the sets of ratchet teeth and the spring pawls, C C, on opposite sides, playing alternately in said teeth, the whole operating in the manner and for the purpose specified.

Also the special construction and arrangement of the pawls connecting with the one pivot, d, and formed hollow, and receiving the springs, g g, the whole operating in the manner and for the purpose set forth.

75,093.—RATCHET BRACE LEVER.—T. A. Weston, Buffalo, N. Y.

I claim the special arrangement of one sliding pawl, F, and one pivoted pawl, E, as described, when combined with a ratchet head, C, having an unequal number of teeth, with said pawls, the whole operating in the manner and for the purpose specified.

75,094.—GLOBE VALVE.—S. H. Whitaker, Cincinnati, Ohio.

I claim, 1st, The self-adjusting metallic valve seat, B, in combination with a conical valve, A, substantially as and for the purposes set forth.

2d, In combination with the aforesaid movable valve seat, B, applied and operated as described, the compressible packing ring, D, for the purpose set forth.

3d, The combination of the movable seat, B, and screw clamp, C, substantially as and for the purposes set forth.

75,095.—FRYING PAN.—R. C. Whitehouse, Boothbay, Me.

I claim the combination and arrangement of the two pans, a b, united by the hinge, c, and having the handles arranged as herein set forth, for the purposes described.

75,096.—BRICK KILN.—H. D. Whittemore, New York city.

I claim the railway cars, a a' a", constructed in the form of a fire grate, and the artificial blast, B, pipes, e e e, with dampers, n, all in combination with the dampers, o o' o", arranged with the vertical partition plates, m m m, all arranged and operating substantially as herein set forth.

75,097.—HOT AIR FURNACE.—Charles F. Whorf (assignor to himself and Charles M. Elleard), St. Louis, Mo.

I claim, 1st, The distributing chamber, E, the water vessel, F, and the furnace, A A' B, when combined and arranged as described and set forth.

2d, In combination with the above, the series of pipes, B, the annular heating chamber, B', and the pipes, C and C', as and for the purpose set forth.

75,098.—CONSTRUCTION OF WALLS OF BUILDINGS.—Charles Williams, Vineland, N. J., assignor to himself and Isaac B. Ward, New York city.

I claim the arrangement of lattice framework, substantially as herein shown and described, in combination with concrete material, in the formation of walls, substantially as and for the purpose described.

75,099.—AXLE FOR VEHICLES.—J. A. Williams, Elizabeth, Ill.

I claim, 1st, The serrated extension, T, of the spindle, E, of an axle, in combination with a serrated rack, R, for holding the said spindle firmly to its place, substantially as and for the purpose shown and described.

2d, The longitudinal slots, substantially as described and for the purpose specified.

3d, The reversible character of the rack, R, substantially as described and for the purpose specified.

75,100.—OIL CUP.—N. Bangs Williams, Providence, R. I.

I claim the tapering compressing plug, a, in combination with a chamber, B, containing a fibrous absorbent, for the purposes specified.

75,101.—CIDER MILL.—J. D. Willoughby, Shippensburg, Pa. Antedated Feb. 20, 1868.

I claim the arrangement of the grinding-rolls, B, relatively with one or more pairs of pressing rolls, C D, and the spouts for receiving and conveying separately the various qualities of juice produced, substantially as shown and described.

75,102.—SURFACE CONDENSER.—I. Shield Wilson and Horace See, Philadelphia, Pa., assignors to themselves and N. D. Thompson, Bordentown, N. J.

We claim, 1st, Removing the condensed steam, after it has passed through a surface condenser, and discharging it directly into the boiler of the feed pump, when arranged in connection with the air pump, in the manner and for the purpose set forth.

2d, The pumps, I and J, when arranged in respect to the surface condenser, E, substantially as described and for the purpose set forth.

75,103.—HEMP HARVESTER.—R. C. Wrenn, Waverly, Mo.

I claim in combination with a machine for cutting hemp, the curved apron, D, placed behind the cutter bar, constructed, arranged and operating substantially as described.

75,104.—HILLSIDE PLOW.—H. B. Abbott, Felicity, Ohio.

I claim the combination with the two bar shares, E E', connecting sheath, G, and double mold board, F, of the connecting bar, I, bracket, C, and locking bolt, J, the latter being shifted from one set of staples to another on the opposite sides of the plow beam, as and for the purpose explained.

75,105.—CARRIAGE HUB.—Seaman Allaire (assignor to himself, Robert Henry and E. Wright Vail), New York city.

I claim the solid metallic hub, A, provided with radial sleeves, b, and wooden spokes, B, when constructed and combined essentially as shown and described.

75,106.—CASTING ALUMINUM PLATES ON ARTIFICIAL TEETH.—Wm. Allender, New London, Conn.

I claim, 1st, In combination with the pouring of molten aluminum to form a base for artificial teeth, the so making and grinding off the blocks of teeth designed for the reception of molten aluminum as a base, as that the metal cannot seize or gripe, but slip upon the teeth or blocks, in contracting, and thus prevent the fracture of the metal, or of the teeth, or blocks of teeth, substantially as described.

2d, In combination with teeth or blocks of teeth, on which aluminum is to be cast for a base, the pointing of the pins or rivets towards each other or towards the center of the block, or in the line of the greatest contraction, substantially as described.

3d, In combination with the molding of teeth or blocks of teeth, or preparing them to receive molten aluminum, which is to form their base, the protected space between them, to guard against the entrance of the metal, or other material, as described, so that the contractile force of the aluminum, in cooling, may draw them up together, or nearly so, substantially as described.

75,107.—GRIDIRON.—Wm. Andrews, Allegheny County, Md.

I claim bars, e e e, united as described, and forming an imperforated bottom, in combination with the rim, d, the basin, B, and the mouth, C, constructed substantially as and for the purpose set forth.

75,108.—TRUSS AND SUPPORTER.—G. W. Antisdale, Chagrin Falls, Ohio.

I claim the upright bar, E, horizontal bar, C, adjustable pad, G, and pad H, as arranged in combination with the frame, A, for the purpose and in the manner set forth.

75,109.—COWL.—Charles W. Atkeson, St. Louis, Mo.

I claim, 1st, The funnel head, A, when combined with the duct, B, the guide C, and the weather cock, C2, substantially as described and shown.

2d, The funnel head, A, when constructed by means of the two disks, a, and the vertical partition, a1, the whole combined and arranged as described and set forth.

75,110.—MANUFACTURE OF GLASS WARE.—James S. Atterbury and Thomas D. Atterbury, Pittsburg, Pa.

We claim, 1st, As a new article of manufacture, a pitcher, A B, produced by blowing a glass or other suitable material in a mold, and providing it with a metallic cover, substantially as described.

2d, The method herein described of perforating glass pitchers and securing the covers upon them, substantially as described.

75,111.—STREET SPRINKLER.—L. F. Bancroft, Worcester, Mass., assignor to himself and Andrew B. Yetter, New York city.

I claim, 1st, The combination of the side water guards, D D, with the sprinkler, A, substantially as and for the purposes set forth.

2d, The combination with the water guards, D D, of the bent levers, e e, arms, E E, and springs, h h, substantially as and for the purpose set forth.

75,112.—PUMP.—John S. Barden, Providence, R. I., assignor to Wm. M. Stone, Attleborough, Mass.

I claim the combination and arrangement of the internal annular nut, G, and its screw, e, with the nose head, B, connected with the base, A, by the series of rods, C C, such nut, G, serving to confine the glass barrel or tube, D, within the pump frame, as specified.

75,113.—DRYER.—David Barker, Northfleet, England.

I claim chambers for drying artificial fluid and other substances, subdivided into horizontal compartments, as hereinbefore described, by permanent or removable partitions, and provided with series of lateral apertures arranged along the lower part of each compartment for the escape and withdrawal of vapors therefrom, the whole being constructed and arranged substantially as herein set forth.

75,114.—WASHBOARD.—Jacob H. Beidler, Lincoln, Ill.

I claim the corrugated perforated face plate, C, in combination with the longitudinally-corrugated board, B, when used in a washboard, as and for the purpose set forth.

75,115.—CENTER PLATE FOR RAILROAD CARS.—George W. Bennett, White Haven, Pa.

I claim the combination of the rings, a a', having the recesses, c c, and projections, c' c', operating in connection with each other when used in a center plate for cars, substantially as and for the purposes specified.

75,116.—GATE.—Geo. W. Bishop, Stamford, Conn., assignor to John Laburt, Cohocton, N. Y.

I claim the combination with a gate whose horizontal rails are pivoted in advance of each other, substantially as herein described, of a slotted top rail and pulley, all constructed, arranged and operating substantially as herein specified.

75,117.—ROTARY STEAM ENGINE.—J. S. Boicourt and T. H. Barnes, Boonesboro, Iowa.

We claim the arrangement of the sliding valves, E, and the springs, F, with reference to the pistons, D D, as herein set forth and described.

75,118.—BELL PULL.—Sterling Bonsall and Louis Hillebrand, Philadelphia, Pa.

We claim, 1st, The construction of a plate, B, with the opening, a, at the upper end, and boss, k, at the rear, the slot, b, at the lower end, with a pintle c, cast into and across the middle thereof, and with the screw hole, d, substantially as described for the purpose specified.

2d, The construction of a handle, C, with a forked end at the lower part, a tongue, E', at the inner side of the upper end, and a knob or projection, D, on the outer side of the upper end, substantially as described for the purpose specified.

3d, The combination of plate, B, and handle, C, with the bar, E, so fastened at f, as to make the slot, l, resting over the pintle, c, and restrained by the plate, B, act as a hinge, with the fulcrum inside of the perpendicular of the lever, substantially as described.

75,119.—CORN HARVESTER.—Elihu Boswell, Highland, Ohio.

I claim the sliding stop, composed of the rod, r, and spring, s, when these parts, constructed and operating together as explained, are used in combination with the revolving reels or tables, R' R', for the purpose of controling their action, substantially as described.

75,120.—IRONING STAND AND CLOTHES DRYER.—B. S. Boydston, Richmond, Ind. Antedated Feb. 28, 1868.

I claim, 1st, The stand composed of bars, A A A' A', strips, a a, and clothes receptacle connected by means of the stay, a, set forth, and provided with the ironing board, B, in the manner and for the purposes described.

2d, The combination of the bars, d d, with their keepers, and the slats, f f, with the stand, as described and for the purposes set forth.

75,121.—WATER WHEEL.—N. F. Burnham, York, Pa.

I claim the combination of the curved chutes, s s, when constructed with curved walls near the outer extremity, and straight slightly converging walls towards their inner extremity, in the manner described and shown, with the gate ring, E, surrounding said chute, and having the openings, r r, the whole device operating to receive the water in a direction toward the center of the wheel, and turn it by the concave wall until it is thrown in a compact mass against the buckets, tangentially to them, in the manner described.

75,122.—MACHINE FOR FULLING HAT BODIES.—Angelo Cattaneo, Newark, N. J.

I claim the side piece, h, to the box, f, fitted to swing on the hinge, i, in combination with the hammers, c c, the parts being arranged and operating substantially as and for the purposes set forth.

75,123.—POTATO DIGGER.—J. C. Clark, Elmira, N. Y.

I claim, 1st, the cutter, G, with arc-shaped knives, o, substantially as described.

2d, The cutter, G, sliding arms, F, and pivoted braces, E, combined and operating substantially as described.

3d, The hoes, J, provided with ridges, e, substantially as described.

4th, The hoes, J, sliding arms, I, and pivoted braces, H, combined and operating substantially as described.

5th, The sliding bearing, M, shaft, L, and eccentric, n, or equivalent, in combination with the shaker, O, substantially as and for the purpose described.

6th, The combination of the arm, c, eccentric, u, or equivalent, and reciprocating frame, N, substantially as and for the purposes set forth.

7th, The hinged blocks, k l, in combination with the sliding bearing, M, substantially as and for the purposes set forth.

8th, The combination of the cutter, G, hoes, J, and shaker, O, substantially as described.

75,124.—SPRING EQUALIZER FOR MILL SPINDLE.—T. L. Clark, Mount Vernon, Ohio.

I claim the oblong driver, F, with a short and long jaw, z x, at each end, within which are placed the boxes, C C, bevelled at their tops, and provided with rubber fillings, D D, and followers, E E, when used in combination with the spindle, A, and pinion, B, substantially as and for the purposes set, forth.

75,125.—STEERING APPARATUS.—Geo. H. Colbert, Downsville, Md.

I claim the vertical shaft, d, provided with gear-wheel, c, and cross lever, f, arranged in combination with pinion, b, rudder, D, cords, g g, and pilot wheel, B, substantially as and for the purpose set forth and described.

75,126.—SHOE LACER.—O. H. Cooke, Morristown, Vt.

I claim the within-described lacer as an article of manufacture, consisting of a concavo-convex body, provided with the teeth, c c, and a shank which is curved and which has a convex head upon it, constructed and arranged as and for the purpose herein specified.

75,127.—CULTIVAVOR.—John Crowther, Oxford, Mich.

I claim raising and lowering the frame, A, by means of levers, D and H, and bars, C F and I, and shaft, J, substantially as herein specified.

75,128.—ROOFING FELT.—Francis Curtis, Newton, Mass.

I claim the new fabrication or compound material, above described, consisting of the combination of woolen or worsted rags with wood or wood fiber.

75,129.—WASHING MACHINE.—Geo. Custer (assignor to himself and Wm. Moore), Norristown, Pa.

I claim the box, C, its ribs or projections, f and f', in combination with the ribbed roller, B, and with the within-described device, or their equivalents for imparting a rotary motion in one direction to the box and in the other to the roller, substantially as and for the purpose specified.

75,130.—CARD BOARD FOR PRINTING.—A. R. Davis, East Cambridge, Mass.

I claim subjecting the sheets of wood to severe pressure, by rollers or otherwise, to reduce the thickness of the wood, and to condense and unite the fibers, and thus prevent the card or card board thus made from twisting warping, and breaking, substantially as specified.

75,131.—MACHINE FOR REDUCING AND POINTING WIRE.—T. B. De Forest, Birmingham, Conn.

I claim, 1st, The combination of the two jaws, G and G', with the revolving shaft, D, when constructed and arranged so as to receive from the said shaft a rotory motion, and further combined with the cam, J, and shaft, H, so that the said jaws receive therefrom a vibratory movement, and when both the jaws are movable, or the one fixed and the other movable, substantially as herein set forth.

2d, The hollow shaft, D, carrying the vibrating jaws, G, having combined therewith a head, i, and cam, J, with its stirrup connection, so as to operate in the manner herein described.

75,132.—PIANO-FORTE FRAME.—Andrew Ferdinand Dessau, Washington, D. C.

I claim, 1st, Constructing the bottom beams and frame of a piano of layers of pieces of wood, in the manner substantially as and for the purposes described.

Constructing the beams and frames of pianos by building the same up in the manner substantially as described.

75,133.—GRAIN SEPARATOR.—E. L. Dorsey, Winslow, Ind.

I claim, 1st, The box, B, made in V-shape, and balanced upon the pivoted support, C, so that it will oscillate as and for the purpose set forth.

2d, The screen, E, provided with arms, e e and b b, door-way, R, and slide H, when used in combination with the oscillating box, B, as and for the purpose set forth.

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3d, Spont, L, and slide, K, when used in combination with the box and screen as and for the purpose specified.

75,134.—LIFTING JACK AND SPIKE EXTRACTOR.—J. Douglass, McConnellstown, Pa.

I claim, 1st, The removable base, A, in combination with the post, B, when used in a lifting jack or device for extracting spikes, substantially as and for the purposes specified.

2d, The hook, J, with broad serrated edge, as and for the purpose set forth.

3d, The combination of the rod, F, lever, G, rocking fulcrum, H, spring, s, pawl, I, and spring, I, substantially as and for the purpose set forth.

75,135.—GRINDING MILL.—John Ellston, Cleveland, Ohio.

I claim, 1st, The elastic diaphragm, J, and coller, I, in combination with the stone, substantially as and for the purpose set forth.

2d, In combination with the above, the pipe, M, hinged cover, U, with the curb and fan case, arranged as and for the purpose substantially as set forth.

75,136.—LAMP SHADE.—Jas. Emery, Bucksport, Me.

I claim the screen supporter composed of the two wires, B and C, having two helix coils, serpentine bends, and a projection arranged as set forth.

Also, the screen, as made, with the middle pocket to receive the slider, B, made as described.

75,137.—HEEL FOR BOOTS AND SHOES.—T. S. Engledow, Cedar Falls, Iowa.

I claim the hollow hard rubber, gutta-percha, horn, or other similar heel, a b c, with strengthening ribs, g g, on its interior, and with removable base plates or pieces, A, in the manner as herein described.

75,138.—BAG HOLDER.—E. C. Fairchild, Sunderland, Mass.

I claim the funnel-shaped mouth or frame, B, provided upon its lower edge with hooks, d, and upon one side with an arm, C, and combined with a plate A, which said plate is constructed with lugs, a, for the adjustment of the frame, B, and arranged in the manner substantially as set forth.

75,139.—SPOON.—Solon Farrer, New York city.

I claim, 1st, The movable cover, in combination with the bowl of the spoon, substantially as and for the purpose specified.

2d, The combination, with the spoon and the movable cover, of the lever, D, and spring, c, substantially as and for the purpose specified.

75,140.—COTTON-BALE TIE.—Henry Fassmann, New Orleans, La.

I claim the cotton-hale tie, composed of the plate, A, having the slots, a a, between which is a strengthening ridge, d, on one or both sides of the plate, and having its ends strengthened by stout ridges, b b, cast upon the plate, substantially in the manner and for the purpose described.

75,141.—STEAM GENERATOR.—H. T. Fenton, Phila., Pa.

I claim the vertical boiler, its fire box, B, central chamber, D, pipes, E, and tubes, F, the whole being arranged substantially as and for the purpose herein set forth.

75,142.—GRAIN DRILL.—J. R. Finch, Dayton, Ohio.

I claim, 1st, The flanges, e e, in combination with the zigzag wheel or agitator, H, substantially as and for the purpose specified.

2d, The arrangement of the plates, B B, with the movable plate or shut-off C, attached to the bottom of the grain box, A, substantially as and for the purpose set forth.

75,143.—TENTER BAR FOR SHAPING ARTICLES OF CLOTH.—S. L. Fiske, Philadelphia, Pa.

I claim the combination of the parallel tentering bars, b c, their hooks, i, the former, B, and detachable bars, e e, the whole being constructed and arranged substantially as and for the purpose described.

75,144.—FENCE POST.—H. K. Flinchbaugh, Conestoga Center, Pa.

I claim the manner of constructing the sides, A, of a post for a rail fence from a strap iron, in combination with the cap, B, on the spread base, with its feet, a, and braces, C D, arranged substantially in the manner shown and specified.

75,145.—IRON POST FOR WIRE FENCE.—H. K. Flinchbaugh, Conestoga Center, Pa.

I claim the construction and application of the iron post, A, with its spreading base, B B', and feet, b b, when applied in the manner and for the purpose specified.

75,146.—WEIGHING SCALE.—O. Forsyth and J. H. Truex, Rochester, N. Y. Antedated Feb. 20, 1868.

We claim, 1st, Notching the under side of the beams and employing, in combination with the same and the sliding weights, a spring catch, i, operating in the manner and for the purpose specified.

2d, Making the supports, E G, on the pendulum-rod adjustable to different distances apart, in the manner and for the purpose herein set forth.

75,147.—ILLUMINATING OIL.—D. W. Fowler (assignor to himself, G. A. Ewing, and G. G. Kimball), Goshen, Ind.

I claim the combination of the above ingredients, in manner and proportions as set forth and for the purposes specified.

75,148.—HOG-SNOUT SLITTER.—J. J. Gish, Milton, Ohio.

I claim the herein-described slitter, consisting of the frame, B, bar, D, stem, C, spring, G, blade, E, and block, A, all constructed and arranged to operate in the manner and for the purpose specified.

75,149.—MANUFACTURE OF MOLDED ARTICLES.—W. B. Gleason, Boston, Mass.

I claim the process of producing molded articles with an adhering pellicle by the use of a plastic adhesive compound under pressure as a former, substantially as described.

75,150.—SADIRON.—Richard J. P. Goodwin, M.D., Manchester, N. H.

I claim the combination of the hinge joints, E F, and cover, B, with the spring bolt, G, operating in connection with the striker, J, substantially as and for the purpose set forth.

75,151.—PACKING FOR HOSE COUPLING.—R. J. Gould, New York city.

I claim the arrangement of a T-shaped packing piece, a, having the ends of the cross bar flat or V-shaped, in combination with correspondingly shaped recesses, b, in the surfaces to be joined, said packing overlapping the inner surface of both parts, A and R, of the coupling, substantially as and for the purposes set forth,

75,152.—WINDOW SHADE.—J. C. Govers, Washington, D. C.

I claim, 1st, In combination with the roller, C, the spring, g, and journals, D, with slide, e, attached to move in the grooves, G, when constructed and arranged to operate substantially as described.

2d, The roller, G, spring, g, journals, D, and slide, e, attached, in combination with the groove, G, and cords, a and f, when constructed and arranged to operate substantially as described and for the purpose set forth.

75,153.—ROTARY VALVES FOR STEAM AND OTHER ENGINES.—R. D. Gray (assignor to himself and Wm. B. Brittingham), Lafayette, Ind.

I claim, 1st, The construction of the conical valve, F, with recesses and ends with reference to the chambers, F1 and F2, valve chest, D, and ports, D1 and D2, substantially as herein set forth.

2d, The arrangement of the oscillating valve, F, valve stem, G, arms, L and K, tappet rod, I, stops, I', and tappet arm, H, substantially as described.

75,154.—SCRUBBER HOLDER.—H. B. Grebinger (assignor to himself, B. E. Kendig, and C. B. Herr), Millersville, Pa.

I claim the intervening pieces, F, with their perforations, f, in combination with the slotted sides, B c, headed screw bolt, D, all arranged and applied in the manner and for the purpose specified.

75,155.—FIREPLACE.—C. B. Gregory, Beverly N. J.

I claim a fireplace consisting of a perforated casing, surrounded by a mass of gravel or other equivalent granulated material, through which the air must pass to the fuel, substantially as and for the purpose herein set forth.

75,156.—FLATIRON.—John Grussi, Cleveland, Ohio.

I claim, 1st, The draft holes, d d, arranged below the grate, in combination with the grate, H, and vent, c, and chamber, A', as and for the purpose set forth.

2d, The cover, E, body, A, chamber, A', and vent, c, in combination with the grate, H, draft holes, d d, and door, J, substantially as and for the purpose specified.

75,157.—TUG AND CHAIN CARRIER.—John N. Guger, Peoria, Ill.

I claim a tug and chain-carrier attachment for a harness, constructed in the form herein shown and described, and having hooks, G, and pivoted pin, H, combined therewith, all arranged and operating as specified.

75,158.—INSTRUMENT FOR MAKING LOCAL APPLICATIONS IN Uterine Diseases, etc.—J. R. Hamilton, Portland, Oregon.

I claim the cup, A, as constructed and applied, substantially in the manner herein described, for the purposes specified.

75,159.—HAT HOOK.—John Harvey, Scranton, Pa.

I claim the arrangement of the plate, A, arm, B, and spring, C, when the several parts are constructed, substantially as and for the purpose specified.

75,160.—DEVICE FOR COOLING MILK.—L. T. Hawley, Salina, and Amos Westcott, Syracuse, N. Y.

We claim, 1st, The felt jacket or covering, of other suitable material, in combination with the stopper and ice reservoir, A, arranged substantially as and for the purpose above set forth.

2d, The reservoir for ice or cold water, A, constructed and arranged substantially as above described and for the purpose above specified.

3d, The knobs on the collar of the cover, substantially as and for the purpose above set forth.

75,161.—TONIC OR BITTERS.—Jonathan Heisler, Schuylkill Haven, Pa.

I claim the bitters or tonic, compounded and used substantially in the manner and for the purpose as herein described.

75,162.—CANTHOOK.—G. W. Herring, Bangor, Me.

I claim the pivoting of the hook, C, to the bar, B, when said bar is provided with a lip, x, and constructed to operate substantially as and for the purposes specified.

75,163.—APPARATUS FOR HEATING AND PURIFYING FEED-Water for Steam Generators.—J. S. Hooton, New Carlisle, Ind.

I claim, 1st, The combination of the manholes, a a a a, shelves or plates, 1, 2, 3, 4, 5, 6, 7, 8, and the structure or casing, A, constructed and operating substantially in the manner and for the purposes herein set forth.

2d, The filtering case, C, elbow pipe, L, spouts, G and H, in combination with the casing, A, and plates or shelves, 1, 2, 3, 4, 5, 6, 7, 8, all arranged and operating in the manner substantially as herein set forth.

75,164.—PEN REST.—Robert B. Hugunin, Cleveland, Ohio.

I claim the shield herein described, for the purposes specified.

75,165.—HYDROCARBON BURNER.—J. S. Hull, Cincinnati, O.

I claim, 1st, A heater or burner apparatus, supplied at all points of combustion by the force of compressed air acting upon the fluid, substantially as and for the purpose herein specified.

2d, A cut off valve, C, between the pump, B, and the reservoir, for the purpose set forth.

3d, The location of the air and fluid ducts, a and b, outside of the reservoir, substantially as and for the purpose specified.

4th, The double bosses, f, for attaching the pipe coupling to the reservoir, for the purpose set forth.

5th, The arrangement of the burners G G, in numbers upon different tubes F4 F4, which are separated or in sets, provided with cut-off valves, so as to increase or diminish or distribute the burners to any desired extent, substantially as herein set forth.

6th, The superheating tubes, F2 F2, extended over the burners and communicating with the pipes, J J, substantially as and for the purpose herein set forth.

7th, The arrangement of flame deflectors, I I, over the superheating tubes, substantially as specified.

8th, The arrangement of numbers of burners G G, in line with one another, so that the burners, l l l, of each set may be connected with one adjusting shaft, and adjusted simultaneously, substantially as specified.

9th, The adjustment of the said burner points separately to their connections with the common adjusting shaft, for the purpose set forth.

10th, The introduction of the superheated steam jets into the flame jets of the burners direct thereto, substantially as and for the purpose herein specified.

11th, The employment of steam for clearing out the supply and burner tubes, which are so arranged as to admit the passage of the steam through them, substantially as herein described.

75,166.—HOP PRESS.—James Hutchinson, Fond du Lac, Wis.

I claim the improved mechanical arrangement for pressing hops and similar substances, consisting of the hinged lever, G, with its eccentric head, H, block, E, provided with the dogs, c, in combination with the ratchet plates, C, and beam, D, provided with the roller, F, and pawls, a, when constructed and arranged to operate as described.

75,167.—MACHINE FOR BORING HUBS.—Niels Johnson, Berlin, Wis.

I claim the bars, H H, clamps, I and J', pinions, L L, rack bar, J, and set screw, K, for forming a universal clamp for hubs, substantially as set forth.

75,168.—CLOTHES SPRINKLER.—E. H. Kirkham, Boston, Mass.

I claim a clothes sprinkler made essentially as herein shown and described, that is to say, so composed of the elastic bulb, a, tubular stem, c, and foraminous cap, d, the latter being provided with ports and valves, substantially in the manner and for the purpose as hereinbefore explained.

Also the before-described mode of forming and applying the valves, g g, that is, as consisting of the annulus, n, and spurs, g g, applied to the neck of the stem, c, and so as to cover the ports, a' a', the whole being arranged and operating as set forth and explained.

75,169.—BRAKE FOR COTTON LAPPERS.—Richard Kitson, Lowell, Mass.

I claim, 1st, The stationary shoe, C, combined with the friction pulley, B, and swinging yoke, in the manner and for the purpose substantially as specified.

2d, The swinging yoke, consisting of the shield, D, and arm, b, arranged and applied substantially in the manner and for the purpose set forth.

3d, The shield, D, arranged to cover the gears, and form one bearing or support for the shaft of the pinion, a, and pulley, B, as explained.

4th, The combination of the shield, D, gear, F, pinion, a, friction pulley, B, stationary shoe, C, arm or lever, b, transverse lever, g, weight, t, connecting rod, d, and foot lever, G, all arranged to operate substantially as and for the purposes set forth.

75,170.—MANUFACTURE OF SOAP.—John L. Klein, N. Y. city.

I claim the combination of paraffine and ceria-japonica to make soap, using for that purpose the aforesaid compound and ingredients, or any other substantially the same, and which will produce the intended effect.

75,171.—RAILROAD SWITCH.—H. K. Leech, Harrisburg, Pa.

I claim the guide, J, hung in fixed and movable bearings, when constructed and adjusted with the rails, substantially as and for the purpose herein set forth.

75,172.—CAR HEATER.—Almerin H. Lighthall and Chas. F. North (assignors to Charles F. North), Cohoes, N. Y.

We claim a heater for railroad cars having cylinders B and C, fire and ash boxes, as described, rod, N, clutch, O, lugs, L, draft funnel, I, griddle, S, and wire, T, constructed, combined, and arranged substantially as specified.

75,173.—MEANS FOR SECURING TUBES IN SURFACE CONDENSERS.—Wm. A. Lighthall, New York city.

I claim making the slotted apertures in the ends of the tubes of surface condensers for steam engines, in the manner and for the purposes set forth.

75,174.—CORN PLANTER.—John T. Lowrey, James A. Case, and Richard Chew, High Banks, Ind.

We claim the combination of the drag, A, so constructed that the part, A', may be detached, in combination with the parts, B C D E F and G, arranged to operate for planting double or single rows, substantially as described.

75,175.—BOTTOM FOR ICE BOX IN REFRIGERATORS.—Levi H. Mace, Westchester, N. Y., and Frederick S. Gwyer, New York city.

We claim the radially corrugated sheet metal bottom, formed and adapted for use in refrigerators, substantially as and with the advantages herein specified.

75,176.—SCAFFOLDING FOR BUILDING.—James H. Martin, Columbus, Ohio. Antedated Feb. 22, 1868.

I claim, 1st, The combination with the brackets, C, of the bars, a, fitted into the joints of the wall, and braced by suitable tension braces, c, against the strain exerted thereon by the aforesaid brackets, substantially as and for the purpose specified.

2d, The arrangement of a removable hoisting frame, D, with reference to the scaffold constructed with detachable supporting brackets, c', substantially as and for the purpose specified.

75,177.—BORING FAUCET.—Samuel McGee, Madison, N. J.

I claim, 1st, The combination of a faucet with an adjustable cutter so arranged that it may be adapted to faucets of various sizes, substantially as set forth.

2d, Constructing a faucet with a diaphragm, a, to form a chamber in the end to receive the cutting made by the bit in entering the barrel, substantially as set forth.

75,178.—CAR COUPLING.—James S. McMurray, Toronto, Canada, assignor to himself, Thomas R. Fuller, and Samuel S. Fuller, Stratford, Canada, West.

I claim the pin, g, upon the coupling link, I, in combination with the inner beveled end of the slot, e, the pivoted pin, C, crank, G, and weighted crank, E, as herein described, for the purpose specified.

75,179.—MACHINE FOR MAKING PLOW CLEVISES.—Thomas Meikle, Louisville, Ky.

I claim, 1st, The combination of the sliding plate, J, having a fixed center piece, R, attached thereto, with the compressing levers or jaws, H, rollers, I, screw, P, and mechanism for operating the sliding plate, substantially as and for the purpose set forth.

2d, The swages and blocks constructed as described, for use successively in forming a flat iron bar, so that the clevis may be completed by bending it in a machine fitted for that purpose, substantially in the manner set forth.

75,180.—BATH TUB.—John H. Mercer, New York city.

I claim, 1st, The perforated plate, q, at the end of the bath, covering up the descending pipes and their cocks, substantially as set forth.

2d, The arrangement of the pipes, g h k and l, at the end of the bath tub, in combination with the cocks, o and p, the handles of which are above the table piece, w, as and for the purposes set forth.

3d, The arrangement of the float, s, and valve, d, operating in the manner set forth, in combination with the bath tub and perforated end plate, q, as specified.

75,181.—BOOT JACK AND BLACKING BRUSH.—Henry J. Miller, Nashua, N. H.

I claim the combination of the boot jack, A, and brushes, B C, when they are connected together and held in the manner specified.

75,182.—MANUFACTURING GIMLETS.—John Mix, West Cheshire, Conn.

I claim the method herein described of forming blanks for gimlets or gimlet bits.

75,183.—CARRIAGE.—Hiram Moon, Red Creek, N. Y.

I claim the combination and arrangement of the upper and lower part of the circle, A A', with spring brace, k, and perch plate, m, as and for the purpose set forth and described.

75,184.—REVERSIBLE KNOB LATCH.—Wallace T. Munger (assignor to Thomas Kennedy), Branford, Conn.

I claim the combination of the follower, K, provided upon its inner side with the points, k k, for operating the latch, and with projections, L L and n, for receiving the hub, l, the said hub, I, being provided upon one side with a shoulder, i, to form a bearing in the plate of the case, and upon the opposite side a slot, J, and shoulder, m, to receive the projections, L L and n, on the follower, and the whole constructed and arranged so as to operate the latch bolt in the manner herein set forth.

75,185.—CULTIVATOR.—John Neff, Jr., Pultney, N. Y.

I claim, 1st, The draft rod, B, when made and applied and supported by a spring, as specified.

2d, The method of fastening and adjusting the handles by means of the support, E, as set forth.

3d, The teeth, F G H I and J, when constructed and arranged substantially as specified; also the furrow board, when made and applied to the teeth, substantially as set forth.

75,186.—BOOT CRIMPING MACHINE.—John A. Nesbit, Charlottesville, Ind.

I claim, 1st, The guide, B, sliding on ways attached to the frame, A, and so cut away on the lower edge that the clamps may be attached to the edges of the leather while on the brake and under pressure, and used in combination with removable brake, C, adjustable jaws, D, and clamps, G, substantially as described.

2d, The arrangement of the reciprocating guide, B, ways, A, removable brake, C, winch, E, and pinion and rack, F, substantially as and for the purpose set forth.

75,187.—GRAIN REGISTER.—Milton W. Nesmith and George W. Nesmith, Metamora. Ill.

We claim, 1st, A grain measuring apparatus, constructed substantially as described, and provided with a registering device operated by a lever, so arranged that by drawing the measure past it in one direction, the register will be operated substantially as described.

2d, The registering device consisting of the dial wheels, v, provided with the pins, x, and having the gear wheels, m, attached, in combination with the double wheel, u, when said parts are arranged as described, and operated by the pawl, P, as and for the purpose set forth.

3d, The pawl, P, having the dog, t, with the stop, r, and spring, n, all arranged substantially as described.

4th, The combination of the registering device, the pawl, P, and the lever, L, all arranged to operate as and for the purpose set forth.

75,188.—SAW JOINTER.—Walter B. Noyes, Dorchester, N. H.

I claim the jointer, g, constructed and operating as and for the purpose set forth.

75,189.—FRUIT CAN.—Peter Numsen, Baltimore, Md.

I claim, 1st, The combination of a hole, C, and cap, D, shown in figs. 1, 4, 5, constructed and operated in the manner and for the purpose herein substantially set forth.

2d, Forming or shaping a hole, C, as shown in figs, 1, 4, 5, in the manner and for the purpose herein set forth.

75,190.—CORN MARKER, ETC.—J. P. Olin, Westfield, Ohio.

I claim the arms, E, braced and hinged to the frame, A, and markers, B', in combination with the frame, A', and adjustable markers, B, substantially as and for the purpose set forth.

75,191.—SIPHON FAUCET.—T. W. Plum, London, England.

I claim a tap or cock so constructed as that its discharging aperture may be opened and closed below the level of the bottom of the cask or vessel into which it is inserted, and whose inner end consists of or terminates in a floating, flexible tube, all substantially in the manner and for the purpose herein set forth.

75,192.—PIVOTING TEETH.—D. H. Porter, Bridgeport, Conn.

I claim the herein described double-headed, U-rivet, for insertion into mineral teeth, in the manner and for the purpose substantially as herein set forth.

75,193.—HAY ELEVATOR.—H. G. Porter, Grand Rapids, Mich.

I claim, 1st, The arrangement of the horse power with the rachet wheel, D, spool, E, pawl, F, lever, G, and cords, J and K, substantially as and for the purpose set forth.

2d, The combination of the fork with the horse power, ratchet wheel, D, spool, E, pawl, F, lever and cords, when the parts are arranged and operating substantially as and for the purposes set forth.

75,194.—INDICATOR FOR KNITTING MACHINE.—J. C. Potter, Alfred, N. Y.

I claim, 1st, The arrangement of the shaft, E, with the gear wheel, G, ratchet wheel, H, finger, L, and dial plate, F, substantially as and for the purpose set forth.

2d, The combination with the needle supporting bed, and the shaft, C, of a knitting machine, provided with a screw, of the clamp, B, shaft, E, gear wheel, G, finger, L, adjustable dial plate, F, all arranged and operating as set forth.

75,195.—HEAD BLOCK FOR SAW MILLS.—William S. Reeder, St. Louis, Mo.

I claim, 1st, The arrangement and combination of the lever device, E', the graduated limb, E, the rack, D, and the cog wheels, c1, substantially as and for the purposes set forth.

2d, The arrangement and combination of the crank wheel, C', the pawl, c3, ratchet wheel, c2, and the application thereof to actuate the screw, C, to produce the feed motion of the head block, B', as set forth.

3d, The spring brake, F, to prevent small logs from being thrown over too far, when constructed substantially as set forth.

75,196.—MACHINE CLOCK.—Geo. Richardson, Lowell, Mass.

I claim the application of the stationary internal gears, d and i, traveling gears, j and n, and pinions, i and l, when arranged to operate substantially as described and for the purposes fully set forth.

75,197.—PROCESS AND APPARATUS FOR THE MANUFACTURE OF ROOFING FABRIC.—Alfred Robinson, New York city.

I claim, 1st, The process of preparing roofing fabric, substantially as herein specified.

2d, The combination of a system of pressure and saturating rollers, so arranged relatively with each other as to accomplish the purpose of my invention, substantially as herein specified.

75,198.—BOLT HEADING MACHINE.—John Root (assignor to himself and McLagon & Stevens), New Haven, Conn.

I claim, 1st, The arrangement of the cylinder, B, with its projections, f, the levers, c, and die holders, b, so as to force up and withdraw the said die holders, in the manner substantially as described.

2d, The combination of the slide, F, fulcrum pin, i, block, I, and eccentric, L, with the lever, H, all as herein described and for the purpose set forth.

75,199.—WRENCH.—H. Schuyler Ross, Buffalo, N. Y., assignor to Charles G. Ross, New York city.

I claim, 1st, A wrench composed of a stationary jaw, A, a movable jaw, B, cam, D, and handle D, constructed and arranged substantially as and for the purpose specified.

2d, A wrench having its movable jaw, B, operated by a cam, D, pin, h, and groove, C, or their equivalents, substantially as herein specified.

75,200.—TRUNK CORNER.—E. A. G. Roulstone, Roxbury, Mass.

I claim a metal corner for traveling trunks, in which the metal is cut away or incised to form the corner, substantially as set forth.

75,201.—BEEHIVE.—Daniel Rudolph, Sugar Grove, Ohio.

I claim the construction, arrangement and combination of the flanged tin drawers with a wire sieve above, and surrounded by open chambers on each side, as herein described, for the purpose of entrapping moths, millers, and worms, and preventing their infesting the bee-house.

75,202.—HARROW.—J. Ruhl, Defiance, Ohio.

I claim the revolving harrows, B B, hinged frame, C, lever, g, pawl, h, and stationary ratchet wheel, F, all arranged in combination substantially as and for the purpose set forth and described.

75,203.—MODE OF PRESERVING HOPS.—S. Franklin Schoonmaker, New York city. Antedated Feb. 22, 1868.

I claim in connection with a suitably enclosed chamber or compartment, nitrogen gas, when produced from the confined air by the agency of a chemical compound and heat, without the production of carbonic acid gas, substantially as and for the purpose described.

75,204.—COMBINED KNOB LATCH AND LOCK.—Gustav Schumacher, New York city.

I claim a sliding latch bolt, provided with studs, 2, for the cam, b, to act against, and with two talons, 4 and 5, for the key to act upon, in combination with the tumbler, c, stud, 10, and notches, 11 and 19, as and for the purposes set forth.

75,205.—CHURN.—B. W. Shaw and Geo. A. Simmons, Morristown, Vt.

We claim the combination of the cylinder, A, and the wheels, B B, when constructed and operated substantially as and for the purpose herein set forth.

75,206.—RAIL FOR RAILWAYS.—E. R. Shepard, Scranton, Pa.

I claim an inclined and wedge-keyed bolt, constructed substantially as described, in combination with a compound rail, as and for the purpose set forth.

75,207.—COTTON SEED PLANTER.—N. B. Sherwood, Millville, N. Y.

I claim, 1st, The construction and relative arrangement, in connection with the chains, of the conveyer, D, substantially in the manner and for the purposes herein shown and described.

2d, The application of the flat-link chains, C, with conveyers, D, attached to cotton-seed planters, substantially in the manner and for the purposes shown and described.

3d, The sunken channels within the drums, P, and the surface board, J, for the carrier chains, C, or their equivalents, to travel in, for the purposes herein shown and described.

75,208.—APPARATUS FOR ATOMIZING LIQUIDS.—A. M. Shurtleff, Boston, Mass.

I claim in combination with atomizing tubes, an air vessel having means of connection both with the atomizing tubes and a stationary liquid head, substantially as set forth.

75,209.—SCRAPER FOR ICE CREAM FREEZER.—Franz G. Siemers, Winona Minn.

I claim the scraper, E, constructed substantially as described, and made adjustable on the arm, D, as set forth.

75,210.—GAS REGULATOR.—Warren A. Simonds (assignor to himself and Henry H. Hyde), Boston, Mass.

I claim, 1st, The arrangement of cylinder, A, with its interior annular ring or chamber, filled with mercury, and inlet and egress passages, B and D, in connection with floating bell, F, and rod, h, opening and closing valve, l, in valve chest, C, all operating together as and for the purpose described.

2d, The construction of the regulation valve, consisting of valve chest, C, with its triangular opening, n, in plate, O, and having arranged within it slide, l, pressed by spring, m, to open or close the said opening, all operating together as and for the purpose described.

75,211.—CULTIVATOR.—David S. Slater, Poynett, Wis.

I claim a cultivator consisting of the central bar, A, having the adjustable handles, C, and the rigid share, o', attached thereto, in combination with the laterally adjustable side bars, B, having the adjustable shares, o, secured thereto, and all arranged to operate substantially as shown and described.

75,212.—BUTTON HOLE FOR PAPER ARTICLES OF APPAREL.—Benj. M. Smith, New York city.

I claim the metalic shield piece, a, in combination with the button hole, A', of a paper article of apparel, substantially as and for the purpose specified.

75,213.—CARRIAGE WHEEL.—J. C. Sparks (assignor to himself and A. G. Buzby), Philadelphia, Pa.

I claim the arrangement of the ferrule, A, having tapering sockets as described, the fellies, C C', and spoke, B, when projections on the said fellies are recessed for the reception of a tenon on the spoke, which projects through the side of and into the ferrule, all as set forth.

75,214.—WATCH KEY.—George B. St. John (assignor to himself and Norman S. Cate), Boston, Mass.

I claim the combination and arrangement of the elongated swivel or plunger and its surrounding spring with the key-head and the pin, D, substantially in the manner and for the purposes herein shown and described.

75,215.—GRAIN BINDER.—A. S. Stone, Plainview, Minn.

I claim, 1st, The arms, G G', arranged upon the shafts, D D', with the springs, H H', rubber, L, box, O, with twisting device, and pincers, R, and chisels, all constructed, arranged, and operating in the manner substantially as and for the purposes herein fully set forth.

2d, The carrying device, composed of the bar, X, shaft, M, with its cogs, y y1, and wheel, z, with its frame, and revolving pincers, Q, when constructed and used in the manner and for the purposes specified.

3d, The combination of the reaper platform, c, rake shafts, C C', wheels, d d', chains, g g, with rakes, e, and cutters, b b, with the grain binding devices herein described, all arranged and used substantially as specified.

75,216.—COMBINATION PADLOCK.—Enoch E. Stubbs, West Elkton, Ohio.

I claim, 1st, The combination of the safety bolt, f, with the hook, E, and hasp hook, F, arranged and operating substantially as described for the purpose specified.

2d, The spring pawl, D, and eccentric stud, 7, in combination with tumbler, a, and pivoted hook, F, arranged and operating conjointly in the manner and for the purpose described.

75,217.—APPARATUS FOR EXERCISE.—George H. Taylor, New York city.

I claim, 1st, The headed rods, F, driven by any suitable mechanism for producing a reciprocating or circular motion of the headed ends of said rods, substantially as and for the purpose set forth.

2d, The combination, with the headed rods, F, of the lever, G, said lever, G, being driven substantially as described to produce the motion set forth.

3d, The combination, with the headed rods, F, and lever, G, of the crank, K, substantially as and for the purpose set forth.

4th, The combination, with the headed rods, F, and lever, G, of the jointed parallelogram, I, constructed and operating substantially as set forth.

5th, The combination, with the headed rods, F, of the top, B, of the couch, said top, B, being made adjustable to different angles of inclination by means of the hinges, C, and a pawl or prop working in a rack or ratchet, or their equivalents, substantially as set forth.

75,218.—APPARATUS FOR EXERCISE.—George H. Taylor, New York city.

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I claim, 1st. The handle, B, driven by any suitable mechanism by which a vibratory or oscillating motion is imparted to it, substantially as and for the purpose set forth.

2d. The shoe or foot-holder, B', driven by any suitable mechanism by which a vibratory or oscillating motion is imparted to it, substantially as and for the purpose set forth.

3d. The combination with the handle, B, or the shaft, A, crank, C, crank, E, and rod, D, substantially as and for the purpose set forth.

4th. The combination, with the foot holder, B', of the shaft, A', cranks, E' and C', and the rod, D', substantially as and for the purpose specified.

5th. The combination, with the handle, B, and foot-holder, B', and their immediate connections, of the driving shaft, F, pulleys G and H, and a suitable means for applying power, as described, the whole constituting a machine constructed and operating substantially as and to the effect set forth.

75,219.—GEAR-CUTTING TOOL.—Henry R. Taylor, Westport, Conn.

I claim the rotary cutter, made up substantially as described, of a stock or holder and loose or separate cutting-teeth or blades pivoted to the holder, and forming curvilinear sections outside of the latter, and constructed so as to be self-adjustable therein, or relatively thereto and each other.

75,220.—ELEVATOR FOR BUILDING.—David B. Thompson, Brooklyn, N. Y.

I claim, 1st, The arrangement of a single or double inclined plane on the upper or lower, or both ends of the elevator, substantially as and for the purpose specified.

2d. The single or double inclined plane, arranged upon a vertical axis, at the bottom of the elevator, for operation substantially as and for the purpose set forth.

75,221.—MACHINE FOR HEADING BOLTS.—Hiram Thompson, Worcester, Mass.

I claim, 1st, The improved machine as a whole, arranged as specified, with or without the cutting attachment.

2d. The hollow die, S, in combination with the holding die, u, and die, m, for the purpose specified, when the dies, S and m, are operated by the means and in the order specified.

3d. The chambered die-stock, F, constructed as described, in combination with the dies, S m and u, when said parts are arranged as and for the purpose specified.

4th. As means for operating the discharging punch, the cross-bar, W, incline, 5, and cams, Y, combined.

75,222.—STATIONARY SPITTON FOR CARS.—John C. Tunison, Decatur, Ill.

I claim a spittoon, composed of an open-work top, a conical-shaped body, and a weighted valve to cover an opening, f, in said body, all constructed and arranged to operate substantially in the manner and for the purpose described.

75,223.—COAL STOVE.—H. B. Van Voorhis, Pittsburg, Pa.

I claim connecting the stoves, A and B, together by flue, K, and pipes, C D, in such a manner that the smoke of each can be passed beneath and through the fire of the other, substantially as and for the purpose set forth.

75,224.—GATE POST.—W. F. Veber, Perrysburg, Ohio.

I claim the plates, E, and pin, D, as arranged, in combination with the posts, A B, for the purpose and in the manner substantially asset forth.

75,225.—WATER METER.—Franz Wagner and Louis Sexauer, New York city.

We claim, 1st, The oscillating valve, E, with chambers, n n, and ports, o o' p p' in combination with the reciprocating piston, B, stops, k k, toggle-arms, d' f, spring lever, c, and elbow lever, d d', all constructed and operating substantially as and for the purpose described.

2d. The combination of the valve, t, bolt, u, and plug, I, in the mud cistern, H, substantially as and for the purpose set forth.

3d. The channels, s r, in combination with the supply pipe, G, mud cistern, H, and cylinder, A, substantially as and for the purpose described.

75,226.—WINDOW SASH SUPPORTER.—Philipp Wentzel, Mentz, Germany, assignor to H. C. Lauterback, Roxbury, Mass.

I claim the employment of a presser roll or rolls, containing a spring or springs, the stress of which tends to turn the roll and to raise or support the sash, substantially as set forth.

75,227.—COUPLING AND BRAKE.—Thomas Aldridge Weston, King's Norton, England.

I claim a new or improved coupling and brake for transmitting or regulating or arresting motion, the parts of which are arranged or combined substantially in the manner hereinbefore described, and illustrated in the accompanying drawings.

75,228.—PUMP.—Philo B. White and Henry M. C. White, Dowagiac, Mich.

We claim the submerged box, G, provided with a water inlet in its side, channels, B C C', valves, c c', slotted plunger, D, with its valves, d d', said plunger operated by the lever, E, and shaft, F, all substantially as and for the purposes set forth.

75,229.—HARVESTER.—Abner Whiteley (assignor to William N. Whiteley), Springfield, Ohio.

I claim, 1st, The globular roller, B, placed at the inner end of and in line with the finger bar of a harvesting machine, in combination with the bearing wheel, A, and the driver's seat, D, arranged and operating substantially as described.

2d, The globular roller, B, placed on the end of the finger bar, in combination with said finger bar, the main frame, brace rod, E, and driving wheel, A, as set forth and described.

75,230.—MARBLE CUTTING MACHINE.—William Wickersham, Boston, Mass.

I claim, 1st, In marble cutting machines, the combination of the diamond with a chain, in the manner and for the purpose described.

2d, The clamps, u u, in combination with the diamond, in the manner specified and for the purpose set forth.

3d, In machines for cutting marble and other stone, the combination of the diamond chain, c, the chain gears, w w', and the standard, g, arranged and operating as described.

4th. A device for moving the chain standard to any position, consisting of the screw, h, the worm gear, f, combined with the chain standard, constructed and operating as described.

5th, In marble-cutting machines, feeding the machine along while it is working by communicating motion from the driving shaft to one or more of the trucks, substantially as described and for the purpose set forth.

6th, A device for cutting underneath blocks of marble in a quarry, consisting of a diamond chain, chain standard and upright shaft, all arranged, as described, to cut grooves in a horizontal plane, in connection with an apparatus for feeding the machine along while it is working, in the manner and for the purpose described.

7th, A device for cutting channels underneath blocks of marble in a quarry, consisting of a disk, e, on an upright shaft attached to the slide, r, working in the manner described, in connection with a feeding apparatus to feed said disk along while working, in the manner and for the purpose set forth.

75,231.—CLOTHES WRINGER.—George L. Witsil, Philadelphia, Pa., assignor to Thomas E. Hunberger.

I claim the combination of a fixed roller, D', yielding upper roller, D, and springs, E, when the latter are formed as set forth, and attached to the frame at both ends, so as to give them staunchness to resist lateral pressure, and also so constructed as to form bearings for the upper roller, by being bent into the shape, substantially as set forth.

75,232.—SPINNING MACHINE.—David C. Wolf, South English, Iowa.

I claim, 1st, The combination of the fork, s, levers, t and r, plate, i, and pin, u, for clamping and liberating the cord, substantially as and for the purpose herein recited.

2d, The bar, h'", operated by the bar, c'", for holding the roller, k', as and for the purpose herein described.

3d, The wheel, y'", having the pin, x'", and the other means and devices connected therewith, substantially as described for the purpose herein recited.

75,233.—BOTTLE STOPPER.—Isidoro Zamboni (assignor to himself, Peter Zoppi and John Ruedy), St. Louis, Mo.

I claim the cap, C, when provided with a packing surface, c4, and combined with the bottle, A, by means of the hinge, c, and latch, c1 c2, c3, substantially in the manner shown and described.

REISSUES.

2,883.—BOOK COVER PROTECTOR.—Charles L. Alexander and Victoria A. Osborn, Wasnington, D. C. Dated September 24, 1867.

We claim, 1st, The elastic or exsensible bands or straps, b b b b, connecting the top and bottom folds, D D D D, by means of clasps or other devices, and thus applicable to various sizes of book covers, substantially as and for the purpose set forth.

2d, The elastic bands or straps, a a a a, to form an expansible connection for the two halves of the book cover protector, substantially as described.

3d, Such a book cover protector or mode of covering books, as, by reason of its expansibility and extensibility, may be adjusted to books of various sizes, substantially as described.

2,887.—WATCH.—N. B. Wallace, Fond du Lac, Wis. Dated September 10, 1867.

I claim the two-part cup, F, for the winding post or other axis of a watch movement, substantially as and for the purpose described.

2,888.—LIGHTNING ROD.—William Hall. Dubuque, Iowa. Dated October 18, 1859.

I claim a cylindrical lightning rod, made of sheet copper in sections, where the sheet is made to extend beyond a single cylinder, leaving the edges open or unsoldered, when the same is constructed substantially as and for the purposes herein set forth.

2,889.—MACHINE FOR CUTTING THREADS ON BOLTS OR NUTS.—Schweitzer Patent Bolt Company (assignees of Franzis Schweitzer), New York city. Dated March 5, 1867.

I claim, 1st, The sliding or movable heads, N O, in combination with the lever, P, and cutters or dies, a b, substantially as and for the purpose described.

2d, The adjustable lever, P, provided with arms, d e, substantially as and for the purpose set forth.

3d, The elastic rest, g, constructed and operating substantially as and for the purpose shown and described.

2,890.—LUBRICATOR FOR STEAM ENGINES.—John Storer, New York city. Dated March 13, 1866.

I claim a lubricator for steam engines, having a movable cap or valve, E, and a screw, F, to secure the said cap or valve in position, so arranged that the screw can turn without carrying the said cap or valve around with it, in combination with a soft metal ring for making a tight joint between the cap or valve and the body of the lubricator, all substantially as and for the purposes specified.

DESIGNS.

2,941.—IMITATION BRAID FOR BONNETS.—Samuel A. Blake, Milford, Conn.

2,942.—CUSPADOR.—John P. Connolly, Ravenswood, N. Y.

2,943.—CLOCK CASE.—Carl Muller, New York city.

2,944.—FIGURE AND BASE.—Carl Muller, New York city.

2,945.—TRADE MARK.—Harrison Parker and Jonathan C. Sleeper, Boston, Mass.

2,946.—PITCHER.—Horace C. Wilcox, West Meriden, Conn.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., *37 Park Row, N. Y.*

34,733.—CHIMNEY FOR LAMP.—Harvey Brown, N. Y. city.— Dated March 25, 1862. Application for reissue received and filed February 14, 1868.

I claim the arrangement and construction of a metal top lamp chimney, as a new article of manufacture, substantially in the manner and for the purposes set forth.

52,107.—VULCANIZING FLASK.—A. B. Woodard (assignor to himself and Thomas Ellis), Alfred center, N. Y. Dated January 16, 1866. Application for reissue received and filed February 15, 1868.

I claim, 1st, closing the flask, A, within the vulcanizing vessel, by the pressure of steam, substantially as herein shown and described, so that while the rubber is gradually heated the flask is gradually and automatically closed, and the rubber molded when in its most plastic state.

2d, Applying steam pressure to close the flask, A, within the vulcanizing vessel by means of a piston.

3d, Forming segmental flanges, , upon the interior of the vulcanizing vessel or boiler, C, and corresponding segmental flanges, K, upon the exterior of the upper part or cover, b, of the flask, A, substantially as herein shown and described, for the purpose of locking the said flask in and to the said vessel.

4th, The segmental connections, e, of the receiver, B, in combination with the flattened sides of the flask, A, and with the piston, f, substantially as herein shown and described, and for the purpose set forth.

5th, The combination of the annular plate, g, and ring packing, i, with the piston, f, and boiler or vulcanizing vessel, C, substantially as herein shown and described, and for the purpose set forth.

66,563.—AXE.—Thomas Bakewell, and John Lippincott, Pittsburg, Pa., assignees of Daniel W. Colburn, Laomi, Ill. Dated July 9, 1867. Application for reissue received and filed Feb. 17, 1868.

We claim, 1st, making that part of the edge of an axe which lies forward of the broadest part of the bit, of a semi-circular shape, or such a modification thereof, as will secure the same results, substantially as and for the purposes hereinbefore set forth

2d, Continuing the cutting edge of an axe, around the swell of the bit on both ends of the axe, substantially as and for the purposes above set forth.

3d, Extending the bit of a semi-circular bladed axe, beyond the poll at both ends, instead of one end only, so that the poll is reversible, and that the handle may be inserted at either end of the eye.

4th, Making an axe with a poll of gradually increasing width from the eye toward the bit, when combined with a bit having a curved cutting edge extending around and back of its broadest part.

49,484.—BOLT MACHINE.—Abram Alexander, Pittsburg, Pa. Dated August 15, 1865. Application for reissue received and filed February 17, 1868.

I claim, 1st, the use of sector dies operated and arranged, substantially as described, for rounding the shank of bolt blanks.

2d. The combination of the sector dies or swedges, c, frame, A, and sliding frame, g g,', for the purpose of rounding the shank of a bolt blank, and leaving square that part thereof which is for making the head of the bolt, substantially as herein set forth.

23,624.—COOKING STOVE.—Philo P. Stewart, Troy, N. Y. Dated April 12, 1859. Reissue, No. 1,673. Dated May 17, 1864. Application for reissue received and filed February 18, 1868.

I claim, 1st, the method or the means, substantially as herein described and set forth, of preventing heat from passing through to the rising flue leading to the chimney, by separating it from the back oven plate and from the descending flues, by non-conducting partitions, or the equivalents therefor, and for the purpose herein set forth.

2d, I also claim the employment of a double damper, filled in with cement or other equivalent non-conducting material, in combination with the flue above the oven, and with the rising flue leading to the chimney in the manner substantially as and for the purposes herein described and set forth.

3d, I also claim the separating of the direct sheet flue, under the oven, from the return sheet flue immediately below the same, by means of the dividing flue plate, i, or any equivalent therefor, constructed, arranged, and combined with the said sheet flues, in the manner, and by the means, and for the purposes substantially as herein described and set forth.

4th, I also claim the dividing of the space between the bottom plate of the oven, and the bottom plate of the stove, by means of the inclined dividing flue plate, i, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

5th, I also claim the employment of the space or chambers, S, in combination with the outer edge of the oven bottom plate, and with the back and oven plate, in the manner and for the purposes substantially as herein described and set forth.

6th, I also claim the sheet flue division plate, i, having a recess, h', at each front corner thereof, and the projection, A, between such recesses, substantially as and for the purposes herein described and set forth.

7th, I also claim the employment of a broad or sheet flue division plate, i, or any equivalent thereof, in combination with the oven and oven bottom flues, in the manner and for the purposes substantially as herein described and set forth.

8th, I also claim the additional bottom plate, or incasement, r, in combination with the broad sheet flue, h, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

23,730.—HARVESTER.—Jacob V. A. Wemple, Quincy, Mich. Dated April 19, 1859. Application for reissue received and filed February 20, 1868.

I claim, 1st, The separating rod or finger, W, for separating the falling grain from that which is being discharged from the platform, substantially as described.

2d, The rod or finger, W, pivoted piece, C, and standard, E, in combination with the rod, B, constructed and operating substantially as specified.

3d, Supporting a movable separating rod or finger upon a single standard or post, located between the platform and main portion of a harvester, so that it can be operated from such post substantially as specified.

37,867.—LAMP.—Care A. Kleeman, Erfurt, Prussia.— Dated March 10, 1863. Application for reissue received and filed Feb. 20, 1868.

I claim, 1st, the notch, i, in the cylinder, f, of the fountain, for the purposes specified.

2d, The cylinder, p, of thin sheet metal, extending from its connection with the cylinder, o, down to the arms, 5, in combination with the chimney holder, v, substantially as and for the purposes specified.

3d, The cone, q, having the air openings, 4, in combination with the chimney holder, r, arms, 5, and cylinder, p, as and for the purposes set forth.

4th, The cup, 3, in combination with the cylinder, p, and wick tube, o, as and for the purposes set forth.

66,522.—PIANOFORTE STOOL.—George Schmidt, Dobb's Ferry, N. Y. Dated July 9, 1867. Application for reissue received and filed February 21, 1868.

As the seats of pianoforte stools have been generally elevated by a screw, and as my invention is designed to overcome the use of a screw for such purpose, by making the seat self-elevating by means of a spring and vertically operating spindle, I therefore disclaim all the use of the screw as a means of elevating the seat of pianoforte stools; but what I do claim is the combination of the seat, A, and spindle, B, with a spring, J, for the purposes herein-before set forth, and substantially as described.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of* 30 *days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* *MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y.*

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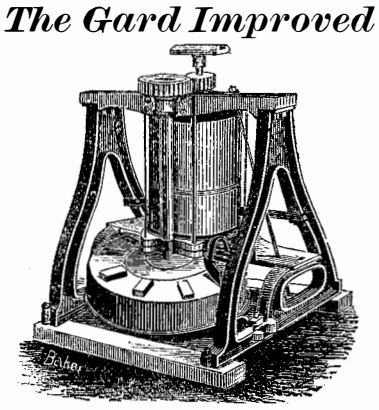

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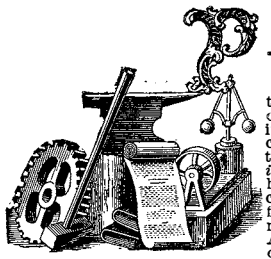

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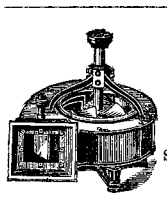

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